

THE IRON AGE

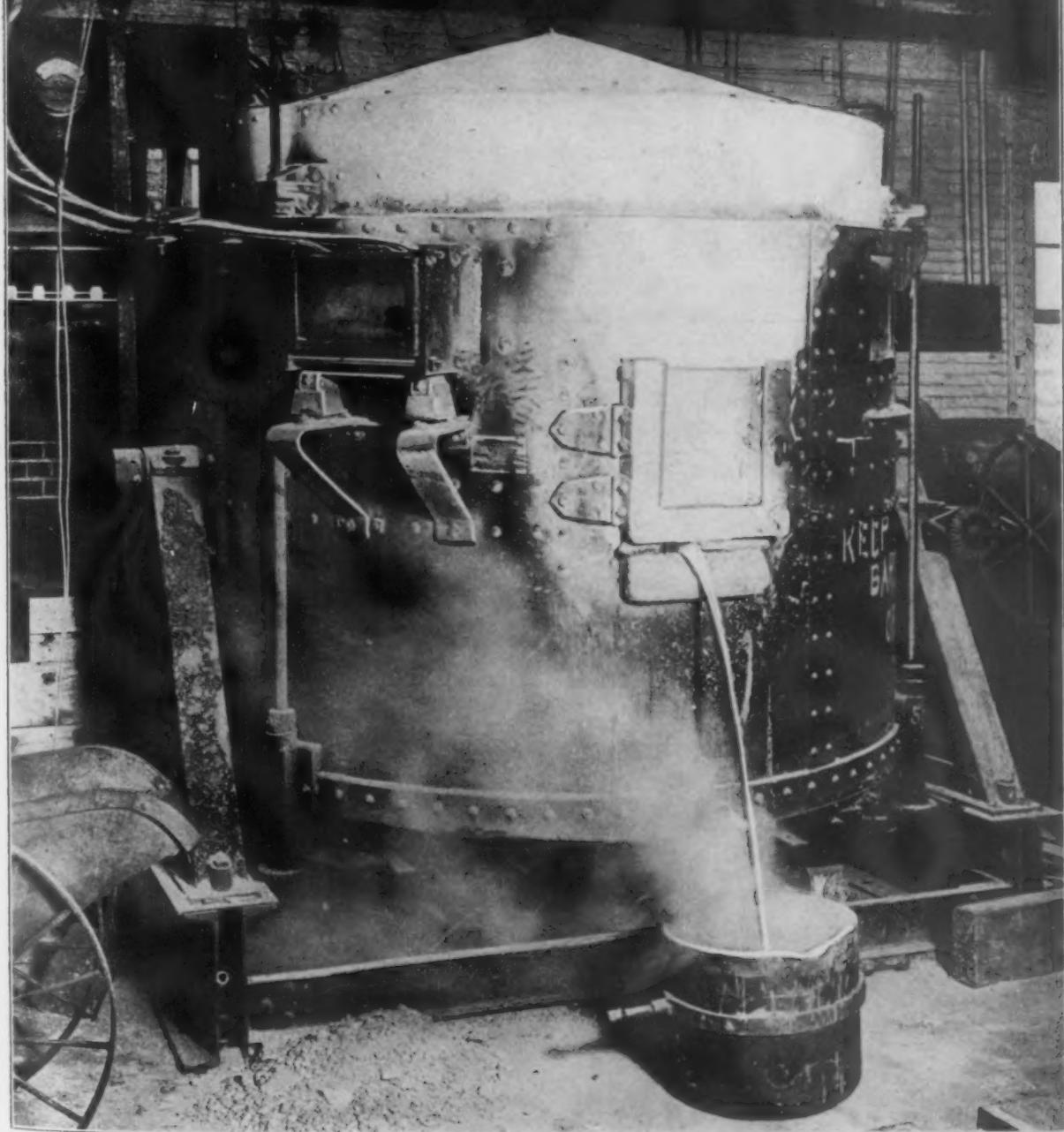
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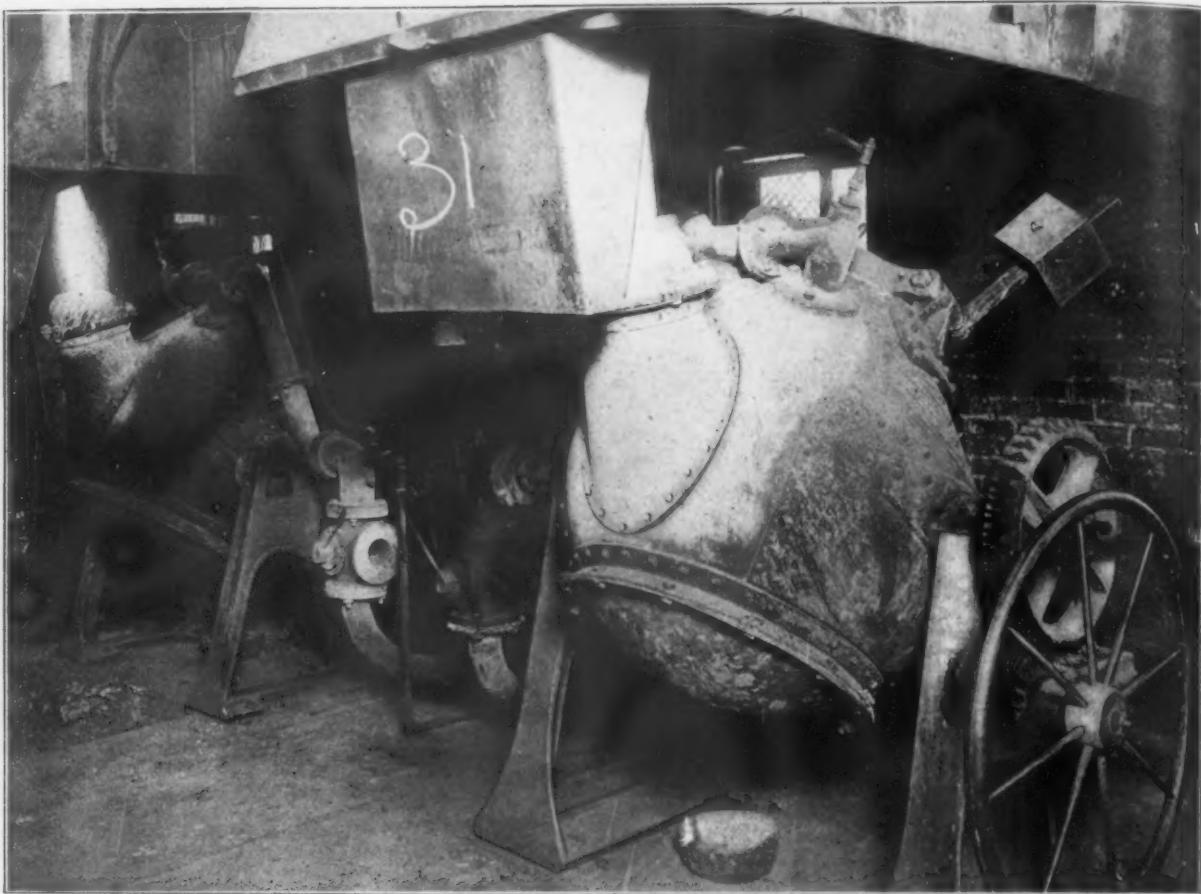
Electric Furnace in the Brass Foundry

A Feature of the Lumen Bearing Plant, Buffalo—Plant Extended for Large Castings, Such as Those of Manganese Bronze



THE position of the electric furnace as a conspicuous and permanent feature in the equipment of the non-ferrous foundry has been established through the experience of the last six months of the Lumen Bearing Company, Buffalo, N. Y. While crucible breakages and delays in the

receipt of crucibles had much to do with the decision to try the electric furnace, its generally satisfactory performance, with the certainty of controlling composition and temperature, and thus definiteness of product, has resulted in provisions for another unit capable of melting alloys requiring



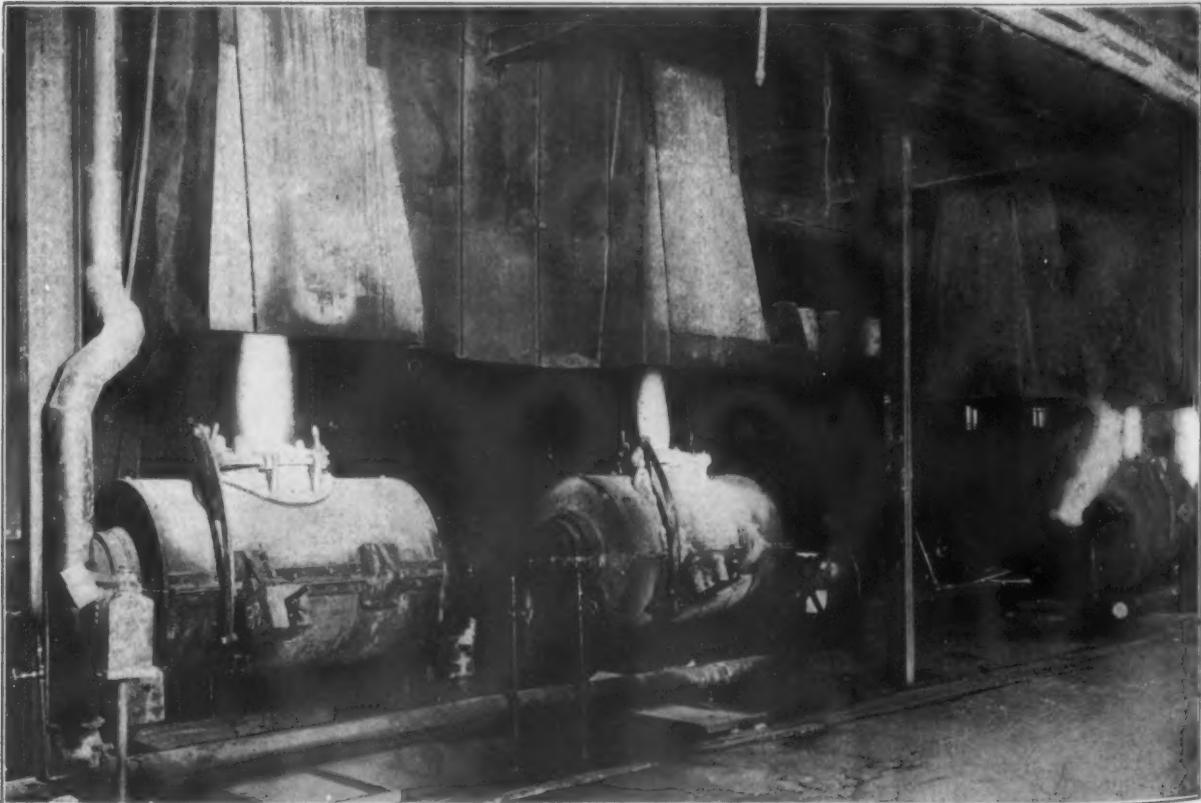
How the Schwartz Oil-Burning Furnaces Discharge the Gases and Smoke Into Hoods and Canopies Connected with Roof Ventilators

higher temperatures than those handled in the existing installation.

The Lumen plant is interesting also in extensions now rapidly nearing completion. This expansion is not alone the result of an increase in orders, but because it has been determined to provide for the manufacture of considerably larger brass and

bronze castings than have been regularly possible with the present equipment and facilities. For example, an attractive volume of business is offered in such castings as the manganese bronze bases of Diesel engines, used in submarines and destroyers; and for general marine construction.

The enlargement of the plant has involved the



Special Design Hoods Over the Simplex Furnaces Help to Keep Foundry Atmosphere Fresh

widening of the existing foundry department and the placing of the core-making department in a central position so that cores may be carried to the molds with a minimum of handling. On the basis of molding equipment and space, the plant will have at least 33 1/3 per cent additional capacity, but through the more efficient handling of materials and better location of departments with respect to one another, it is believed that production may be nearly 50 per cent greater than it has been. The re-arrangement of the works with the moving of the core-making department stands as an interesting instance of what may be done with an industrial establishment which has grown by a succession of additions made from time to time as business conditions seemed to warrant. A very important limiting condition which does not always obtain in other cases is that the Lumen plant is surrounded by a closely built section of the city, with streets on part

alloys for different customers for specific needs, the laboratories control the metals going into each melt and investigate the products in terms of the specifications. The quality of purchased materials is determined by the laboratories.

The plant has a large complement of oil-burning converter-type furnaces and oil-burning crucible furnaces. While the regular crucible furnaces are still in existence, coke has been abandoned as a fuel, even in connection with the core ovens, which are also oil burning, and the crucible pits are changed over to oil burning as may be needed, the plan being to retain crucible melting for such special alloys as may be under investigation or manufacture. The electric furnace is of the Baily type, made by the Electric Furnace Company of America, Cleveland, and rated at 100 kw.

The second furnace is of the same type but the top has been redesigned to withstand higher tem-



The Crucible Pits Are Now Oil Burning

of two sides and a railroad on another, so that plant as designed had to be subordinated to what land areas could be obtained. While the changes are planned to take care of the immediate future they also make some allowances for the possible needs beyond. It was also desired to segregate the small and heavy work with the reduction of indirect labor charges which this should consummate.

The Lumen foundry is notable for its size as a non-ferrous jobbing foundry, but it is a manufacturing organization in the sense that it has built up a large business in the production of bearing metals, particularly Lumen bearing metal, which has been a back log of the company's business, and it also makes babbitt metals and solders. One customer, for example, requires 3 tons of solder daily. The babbitt and solder department is a separate unit.

The Lumen Bearing Company has been noted for its chemical and physical laboratories, which have contributed very largely to the literature on non-ferrous metallurgy. Besides experimenting on

peratures than seemed feasible in the first furnace, in which Lumen metal is melted.

The oil-burning furnaces comprise 350-lb. and 500-lb. Schwartz and 1000-lb. and 2000-lb. Simplex furnaces, two of the larger size forming a part of the melting equipment of the smelting department. Two of the largest size will be shortly installed for large castings.

Up to the present time castings as heavy as 2800 lb. have been turned out, but it is planned to manufacture regularly castings as heavy as 3000 lb. The capacity of the plant will thus be measured by a range of castings weighing 1 oz. to those weighing 1 1/2 tons. To handle molds and ladles for the large castings expeditiously extra crane capacity was needed and an existing crane runway sufficiently strong, was lengthened. Forming a part of the group of melting furnaces, the two new Simplex furnaces will be placed under the main bay crane, a 10-ton double-trolley Euclid. As indicated by the plans here reproduced the molding space for the

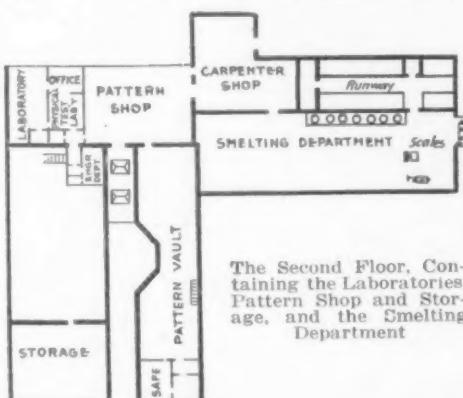
large work will be materially enlarged and much needed trucking space provided along the side of these floors.

The first electric furnace has been moved to the new foundry department where the second electric furnace will also go, with space for a third furnace when it shall be needed. One of the outstanding features of the new foundry is that it is of the modern type of substantially all-glass structure, with steel sash for the larger part of the wall areas and saw-tooth roof. It is lofty, being 19 ft. 6 in. in the clear. A crane, formerly used in the heavy casting department, is to serve the new department.

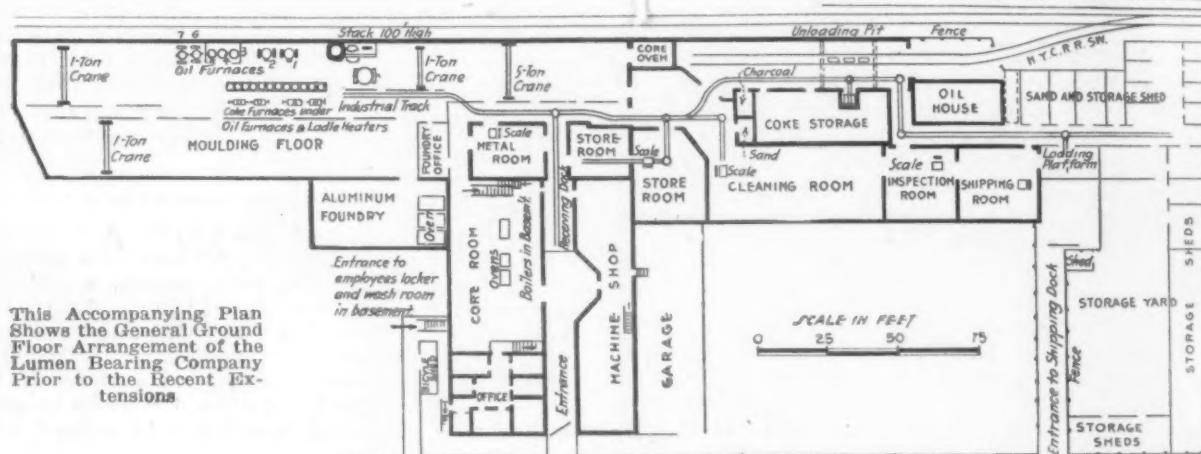
Another feature is a longitudinal arrangement of the skids on which the molds are placed, so that the number of molds may be sufficient to take the contents of a ladle. Eight new Berkshire molding machines have been bought, and while some are located near the outside walls, as usual, the lighting is so good that it has been possible to place the remainder under a section of

and the ovens. Core machines on the other side deliver to a similar set of carriers. The gravity carrier serves the stock core racks from which cores are taken for use in the foundry. The blackening bench is conveniently located, as indicated. A noteworthy feature is the adequate core oven capacity. There are four ovens for the smaller cores between the two lines of gravity carriers and four double car ovens. Besides this, if necessary, part of the shelving space for finished cores may be preempted for another oven. All in all the core room stands as a proof of an increasing demand in cored alloy castings and in particular of the special need of heavy castings.

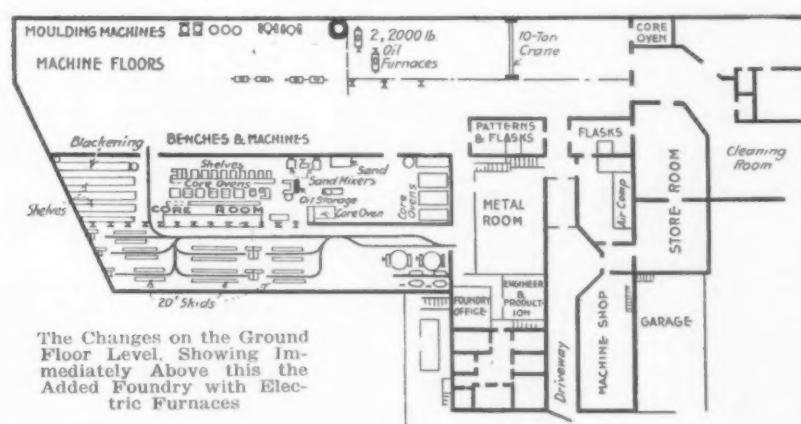
The moving of the core department to its new location has given space for a commodious metal room and has also provided space for the foundry superintendent's office which until now has occupied valuable



The Second Floor, Containing the Laboratories, Pattern Shop and Storage, and the Smelting Department



This Accompanying Plan Shows the General Ground Floor Arrangement of the Lumen Bearing Company Prior to the Recent Extensions



The Changes on the Ground Floor Level, Showing Immediately Above this the Added Foundry with Electric Furnaces

the saw-tooth roof. Space is also provided for portable roll-over molding machines.

The present or old foundry floors devoted to small castings are not changed, except for a wall opening toward one end, which allows communication with the new core room. Incidentally it is to be noted that this opening gives opportunity for connecting the overhead trolleys of the two molding departments.

The new core room is laid out on the scheme of the existing core room, with core-maker's benches along one side and gravity carriers between them

What Was the Aluminum Foundry Has Now Been Extended and Converted into a Core Room with Added Facilities. A new lofty building also adjoins this for making the smaller castings and contains two electric furnaces. The moving of the core room, has allowed for other improvements, which may be noted from the plans, not the least important of which is increased capacity for large non-ferrous castings for which two 2000-lb. oil furnaces have been secured

foundry floor area. Space has also been provided for the engineering and production departments. The former metal room was inadequate and its space is now well utilized for patterns and flasks stored temporarily, awaiting immediate use.

The rearrangement has made for the ready delivery into the general storeroom of raw materials received by motor truck or wagon as well as from the railroad. Formerly there was no adequate intermediate resting place for patterns and flasks between the time they were ordered on specific jobs and were ready for the foundry floors. The raw material storeroom incidentally has been enlarged. A part of the old machine shop has also been set off for the master mechanic.

The plant is conspicuous for the special care taken to insure the exhaust of the smoke and fumes

An interesting form is used to keep a record of melting activity. A small card is issued for each alloy melt, and on this by means of a time clock is noted the time that the metal is charged and then the time that the metal is ready and finally the time that the heat is pulled. The card also gives a

record of the weight and the number of the alloy. If there is any delay between the time ready and the time pulled it is noted on the card. These cards are posted on the larger blank with each line, or more if necessary, to indicate the continuous record for the day of each particular furnace.

from the furnaces and the general foundry and core room. Over the furnaces and the core ovens and the core cooling racks are hoods which deliver to roof exhaust heads. The roof ventilators are generously distributed over the entire roof area and have proved efficacious in maintaining a clean atmosphere. Heating in winter is very largely accomplished by means of a fan system with sheet metal air delivery pipes distributing the warm air.

The employees' entrance leads to locker rooms underneath the general offices and here are provided mess tables. A small lunch counter with tobacco, supplies and soft drinks is maintained, and at 9 o'clock in the morning 10 minutes is allowed for recreation and lunching and smoking in the locker and wash rooms.

Continuity of employment is recognized by a bonus which is distributed once a year and solely for the reason stated. The amount is 10 cents per week for an employee who has been steadily with the company for a period in excess of six months. The distribution in the last two years has taken place at Thanksgiving time and the amounts have ranged from \$2.50 for the man employed six months to \$80 for the man of the longest tenure of employment. The foremen also get a bonus dependent on the reduction effected in manufacturing costs. Every Saturday morning a meeting is held by the manager, superintendent, planning department head and the foundry foremen to lay out the next week's production.

William H. Barr, president National Founders' Association, is president of the Lumen Bearing Company. H. P. Parrock is manager; N. K. B. Patch is works manager; L. S. Jones is sales manager; Verne Skillman is metallurgist; Otto Paehlke is superintendent, and A. Lockwood is purchasing agent and in charge of the planning department.

The Field of the Electric Furnace

Harry Etchells, one of the designers of the Greaves-Etchells electric steel furnace, described in **THE IRON AGE**, Jan. 11, 1917, in a recent lecture before the Sheffield Society of Engineers and Metallurgists, said that when dealing with the cost of melting, even at the present comparatively high prices caused by war conditions, the electric furnace had proved a good investment to many users and an immense boon in the economy of steel production and utilization of scrap. "The war has shown us," he said, "how to make ourselves independent

of Swedish Bessemer imports and to convert into valuable steel the accumulation of nickel and chrome steel scrap. In spite of difficulties of manipulation, which still remain to be overcome, the electric furnace has a part of its own to play, and has come to stay." Prof. J. O. Arnold, the president, observed that if the electric furnace had come to stay, there would have to be cheaper current; that this is one of the greatest obstacles to the development of the electric furnace in Sheffield, which would have to be got over in some way.

Molybdenum in the United States

An investigation has been made by the U. S. Bureau of Mines to ascertain why molybdenum as a possible source of economic wealth in this country should remain undeveloped. It is reported in Bulletin 111, "Molybdenum, Its Ores and Their Concentration." A preliminary review of the situation showed that the market for molybdenum in alloy steels must be developed or that new uses for the metal must be created before the demand would be sufficient to warrant any extensive mining of the ore.

One of the chief factors in retarding demand from the alloy-steel trade was that manufacturers who might use the metal were kept out of the market by the fear of not being able to obtain steady supplies. On the other hand, those who might develop the extensive low-grade molybdenite or wulfenite deposits in this country were prevented by the small visible demand and the fear that any large production would glut the market. Owing to these conditions the mining of molybdenum has in the past been confined almost entirely to small-scale operations on high-grade streaks of molybdenite ore, and the methods of recovery have been limited largely to cobbing and hand picking.

The problem before the Bureau of Mines was to ascertain the character and extent of the deposits of molybdenum ores in the United States from which supplies requisite for the development of the market might be obtained, and how the ores might best be concentrated into a marketable product. The direct purpose of the bureau is, on the one hand, to prove to possible consumers of molybdenum that the element is not as rare as commonly supposed, and that this country possesses many deposits of low-grade ore from which large supplies may be derived; and, on the other hand, to prove to present and prospective producers of molybdenum that there is a latent market for their product in the alloy-steel trade which needs only the assurance of steady supplies for a considerable development.

The No. 1 blast furnace of the Worth Brothers Company, Coatesville, Pa., was blown in Jan. 20. It had been shut down for repairs since Nov. 25.

Plant for Pressing and Welding Steel

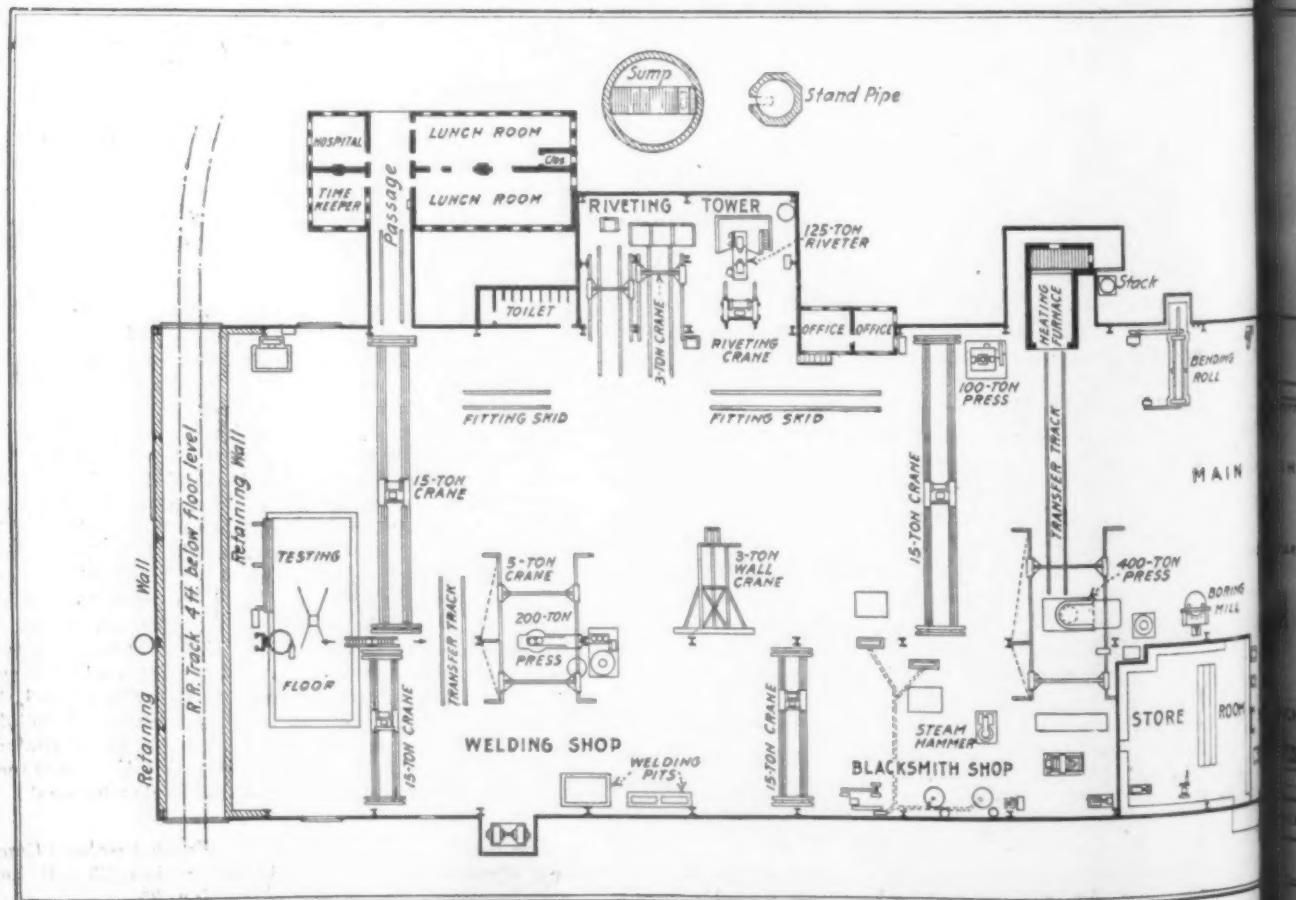
Equipment of Knox Pressed & Welded Steel Company at Wheatland, Pa., for Making Water-Cooled Parts for Furnaces

In 1911 the Knox Pressed & Welded Steel Company, Pittsburgh, was organized by L. L. Knox, Irvin F. Lehman and others to manufacture open-hearth furnace devices, invented and patented by L. L. Knox, of Pittsburgh. For some years Mr. Knox had given much attention to the development of devices, looking not only to the comfort and protection of workers at open-hearth steel furnaces, but also to the prolonging of the life of the furnace, and to secure a larger output with practically no increase in cost. For some years he had his different devices manufactured on contract, but owing to the growth of the demand for them the Knox Pressed & Welded Steel Company was organized as a manufacturing as well as selling organization. The first plant of the company was located at Niles, Ohio, and was operated on a small scale. This plant burned down in a little more than a year from the time operations started, and the company then removed to Farrell, Pa., securing the works formerly operated by the Sharon Boiler Works. This plant was completely rebuilt, the equipment needed for manufacturing the products of the company was installed, and operations were started in August, 1914.

While at Farrell the company took up the manufacture of steel products in addition to its specialties and it soon became necessary to secure larger manufacturing facilities. With this in view, the company commenced to look about for a suit-

able site for a much larger plant. The necessary ground not being available in Farrell, it was decided to locate at Wheatland, Pa., where the company secured a 30-acre tract, located 68 miles north of Pittsburgh on the Erie division of the Pennsylvania Railroad. The location at Wheatland was selected primarily because of favorable labor conditions, as that district draws from New Castle on the south and Greenville on the north, these towns being readily accessible from Wheatland by railroad and interurban trolley lines and workmen being able to reach homes in a very short time from the plant.

Of the 30-acre tract, 12 acres or more were used in the building of the plant, including receiving and shipping yards, storage yards and ground needed for other purposes. The ground plan herewith presented gives an idea of the layout. The whole property is inclosed by an 8-ft. fence which gives privacy to all operations. The main factory building is of steel construction, 114 ft. wide, 500 ft. long with a main bay, 70 ft. in span and 35 ft. high to the crane rails. The roof of this building is of the Warren-Ehret slag roof construction. The entire building is exceptionally well lighted, monitors being located in the roof and affording ventilation as well as lighting. The lighting has been found so satisfactory that few shadows are thrown in any part of the building, a point of importance in laying out and doing particular work. The bay is served by three 15-ton



Northern Engineering electric cranes, six 3-ton Northern wall-gantries and a number of jib cranes serving individual tools. These cranes are of special design, made by the company itself, and are equipped with Northern 3 and 5-ton electric hoists. Located at the western side of the main building is a 42-ft. aisle which contains the power plant, machine shop and stock room, taking about one-half its length, while the remainder contains a welding shop served by two 15-ton electric traveling cranes, one a Case and the other a Cleveland crane, and also a number of jib cranes.

Handling of Materials

Direct switches from the Erie division mentioned provide for material receiving and loading tracks. A spur is used for receiving coal. The main switch track extends through one end of the main shop, depressed, 4 ft. below the floor level, runs in a circle outside to a similarly depressed track at the outgoing end of the shop, which in turn connects with the main spur from the Erie division. All materials are received at one end of the main building directly from cars on this depressed track, and may then be taken by the overhead cranes. Finished products at the other end of the main building are handled in a similar way. The entire shop floor in the main building is of vitrified paving block, and an alleyway in the center of the main bay is marked by two strips of white paint 6 in. wide and 7 ft. apart. This is a safety zone for the passage of workmen to all parts of the plant, and is kept open at all times. Any breaking of this rule is liable to cause discharge of the offender.

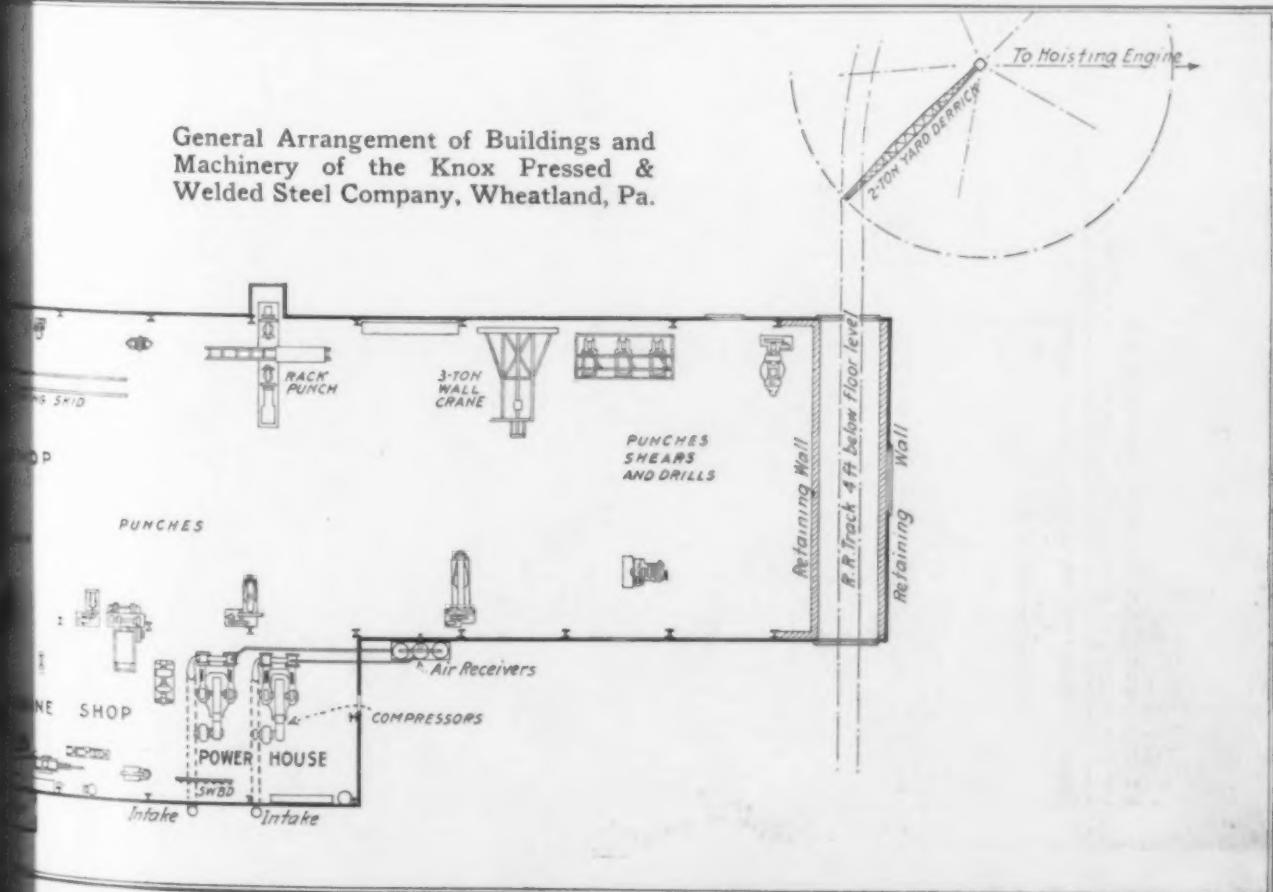
The products of the Knox Pressed & Welded Steel Company are largely pressed and welded steel specialties, but include also a general line of steel-plate construction, such as blast-furnace downcomers, riveted pipe, tanks, ladles, etc. Spe-

cial tools were required. The main equipment includes a 100-ton Morgan Engineering power press, a 200-ton United Engineering hydraulic press, a 400-ton Mackintosh, Hemphill & Co. hydro-pneumatic press and also gang drills, vertical and horizontal punching machines, including one with 72-in. gap, capable of punching a 6-in. hole in 1-in. plate. There are also two hydro-pneumatic riveters, one of 80 in. gap, having a capacity of 80 tons, and the other of 100 in. gap, rated at 125 tons. The castings for these riveters were made by Mackintosh, Hemphill & Co., while the general design and all the other parts were made in the company's shops. There are also bending rolls, which are 14 ft. between housings, planing machines, slotting machines, lathes, portable drills, air hammers, etc.

The material employed in the construction of the Knox devices is, as a rule, what is known as dead soft flange steel. The plates used vary in thickness from 5/16 in. to 1 1/4 in., and are furnished in multiple lengths. These plates, taken from the stock yards, are delivered by overhead cranes to a corps of layers-out where all markings are completed. They are then removed to machines and irregular cuttings are made, after which they are pressed and formed on either the 400-ton press or the 200-ton press.

At this point work is segregated into two classes: the patented devices and competitive work. The patented devices after being formed are taken off the presses on the side adjoining the 40-ft. aisle, where they proceed to the fitters, thence to the welders, and are finally tested on a concrete testing floor 25 ft. wide and 60 ft. long. On this testing floor there is suitable apparatus for hydrostatic tests, whereby hydraulic pressures can be applied up to 250 lb. per square inch. For pressures up to 110 lb., air pressure is applied to the interior of a hydraulic tank under the control

General Arrangement of Buildings and Machinery of the Knox Pressed & Welded Steel Company, Wheatland, Pa.



of Foster regulators. As needed the liquid is forced out of the tank and into the device at the pressure desired. Pressures over 110 lb. per square inch are obtained by means of a Worthington plunger pump operated with compressed air at 110 lb. Two gages are always used; one on the piece being tested and the other at the point of delivery of the water. Pieces found defective are sent back to the welders, while the perfect pieces are piled until all parts are ready for shipment.

The company has facilities for handling intricate work that ordinarily is not desired or sought after by other concerns. Such work, after leaving the punches, shears, etc., is either taken to the bending rolls or to the hydro-pneumatic presses, and then into the main aisle of the building, where the work of fitting, riveting, caulking and testing is completed.

On the left side of the two white safety lines as seen in the general interior view is located the fitting department for competitive work, the equipment consisting of two bevel shears, rolls, drill presses and other smaller machines. On the right side of the two white safety lines is the equipment used in the manufacture of the Knox specialties. In the foreground is the 200-ton hydraulic press, while a near center view shows the 400-ton hydro-pneumatic press.

Nearly 80 per cent of the work turned out by the Knox Company is welded work, and three different types of welding are employed—electric, which is metallic electrode, oxy-acetylene and furnace hammer welding. The different methods have special applications dependent upon the form and thickness of the parts, and the use to which the finished article is to be put and in consequence the type of welding is that which will give the best results. For some articles all three types are used, in others two and in others only one. Many of the products could not be successfully manufactured, it is stated, without the equipment and skill for doing all types of welding.

There is no steam equipment in the plant whatever, all equipment needing power being operated by direct-connected motors. High-tension power, at 22,000 volts, is purchased from the Youngs-

town & Sharon Street Railway Company, and is stepped down in transformers located outside the main building to 2200 volts. Other transformations are effected inside the building. All machines are equipped with individual electric lamps of 110 volts. There is also in the electric equipment a motor generator set, the motor of which operates at 2200 volts and the generator delivering direct current for the operation of crane motors and a few other machines.

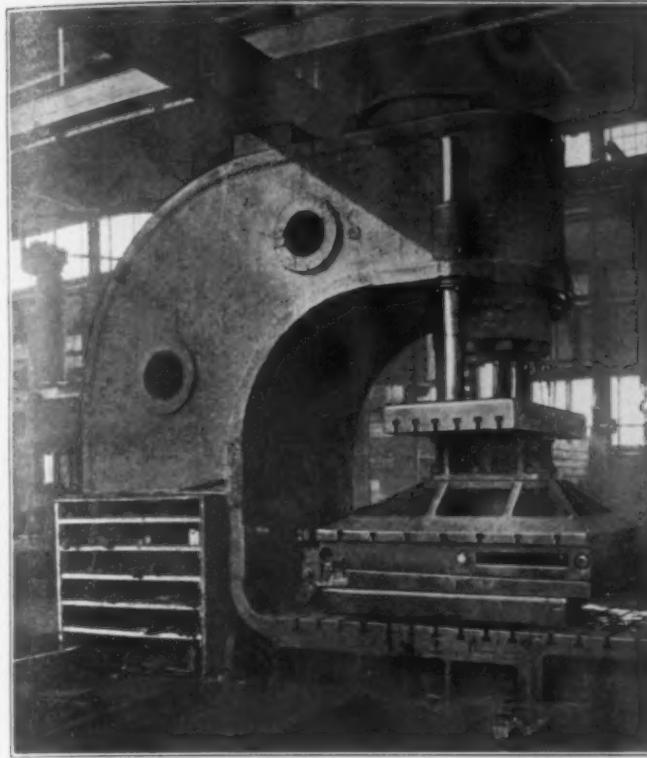
The lighting system is noteworthy in comprising 500-watt incandescent lamps with porcelain reflectors placed as high as practicable, which in the main bay is 42 ft. above the floor. The result is accepted as thoroughly satisfactory, as the lights are not too dazzling and there are no shadows that interfere with the most delicate operations; indeed fine newspaper print can be read at any place on the shop floor.

The business of the Knox Company is expanding so rapidly that only recently it was decided to add a 300-ft. extension to the main building. The contract for the fabrication of the steel work for this extension has been given to the Blaw Steel Construction Company, Pittsburgh. Later the company will be in the market for considerable new equipment for this extension, the exact nature of which has not yet been determined. It is hoped to have this extension completed ready for operation by July 1. Early in the summer the company plans to build a modern office building, one story in height, to contain the general plant offices. It is intended to use the basement some time in the future for a swimming pool, lockers, shower baths and other sanitary equipment for the employees.

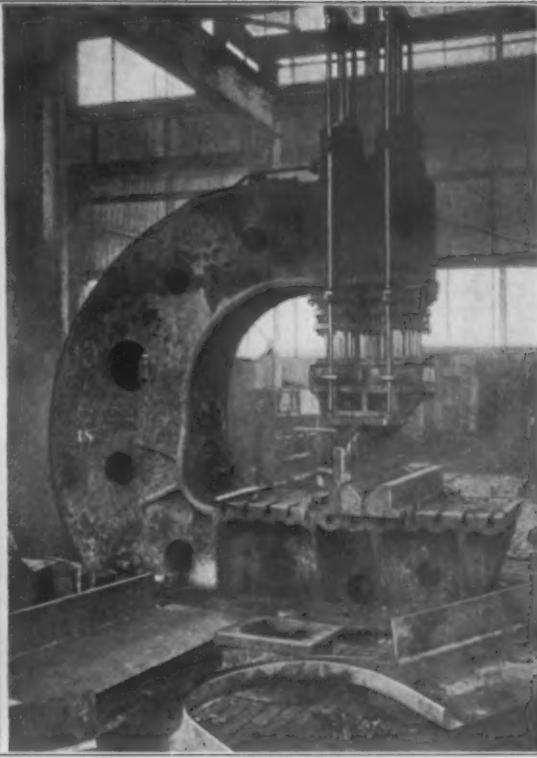
The products manufactured include water-cooled specialties for open-hearth and sheet and tin mills, such as open-hearth doors and door frames, skewbacks, buckstays, port coolers, bulk-head coolers and wall and arch coolers, port and furnace chills for tilting furnaces, doors and frames for heating furnaces, reversing valves and gas inlet valves, shields for sheet and tin mill furnaces, floor stands, water boshes, etc. In addition to these specialties, the company manufactures, as already indicated, a general line of plate



The Use of a Safety Walk, Marked by White Lines and Never to be Obstructed, is Exemplified in This Shop. At the right may be seen the 200-ton hydraulic press.



The 400-ton Hydro-pneumatic Press



The 200-ton Hydraulic Press

work, such as annealing covers, annealing pots, gear guards, scrap boxes, charging boxes, galvanizing pans, acid tanks, etc. The general offices of the company are in the Farmers Bank Building, Pittsburgh. L. L. Knox is president; William C. Coffin, vice-president and sales manager, and Irvin F. Lehman, secretary and treasurer.

Corrosion of Panama Canal Machinery

Corrosion has seriously affected certain parts of the lock machinery of the Panama Canal and extensive renewals have been necessary, although the canal was finished less than three years ago. In this connection it is interesting to recall the destruction of the \$500,000 yacht Sea Call, within a few months after its completion, as the result of galvanic action between the Monel metal plates of its hull and its steel frames and fittings. Similar electrolytic action between dissimilar metals in the valves controlling the lock water supply of the canal has been an important factor in the difficulties at Panama. Brief extracts from General Goethals' annual report give some of the details:

Observations during the past year disclosed that the corrosive action on the cylindrical valves has been severe. In July, 1915, the west flight of Gatun Locks was drained, and all the accessible cylindrical valves were examined. Marked corrosion was taking place on certain parts of the valves, although the entire valve was made of cast iron or steel, no bronze parts being adopted in the original design. In the lower level an average of 75 per cent of the seal segment nuts were corroded; in some cases fully half the nut had disappeared. It was also found that the bolts holding the stops in place were in such condition that they had to be replaced in every valve in the lower level. All valves were put in good condition and painted with red lead.

Considerable corrosion has taken place in the rising-stem valves. The $\frac{1}{2}$ -in. plates have been attacked similar to those on the lock gates, and portions in the vicinity of the rivets in the lower valves at Gatun and the upper and lower valves at Miraflores have been violently attacked. The bottom seal casting of the valve which comes in contact with the Babbitt metal seal on the bottom of the valve is being rapidly eaten away. A number of the valves at the Pacific locks were in such condition that the bottom seal had to be machined off to make the valve tight.

In order to protect the valve from any further electrolytic action between the cast-steel seal and the lower Babbitt-metal seal, all Babbitt-metal was removed and replaced with a seal of greenheart lumber. The top gate-valve seal is of

cast steel and is held in place by bronze bolts. In practically every instance the corrosion has been excessive around the heads of the bronze bolts, cutting away the metal and in some cases allowing the bolts to loosen and fall out. Several castings had to be replaced. The worst case of corrosion of the seal occurred on the upper valves at Miraflores.

At both the Atlantic and Pacific locks considerable corrosion of roller trains has occurred, the rollers being made of tool steel. At the Atlantic locks a number of rollers, bolts, and filler castings were missing. All were replaced, and the heads of all bolts were riveted over to prevent further losses. Similar conditions were found at the Pacific locks, and as it is impossible to protect the rollers by any paint, arrangements were made to install $\frac{1}{2}$ -in. pipes from the tunnel floors down to the base of the roller-train tracks. Crude oil is forced through the pipes, and it is believed from the results of experiments made with a model that the crude oil will rise along the surface of the roller-train track and in this way protect the rollers by coating them with oil.

Local Surface Hardening of Gear Teeth

An English process, reported to be largely used for hardening gear teeth, is known as the Vickers. It is local surface hardening and consists in applying momentarily to the surface of the part to be treated an intensely hot flame from an oxy-acetylene blow pipe. The surface having been raised to a high temperature, is quenched by the cold body of the metal beneath. The equipment is that usually provided for oxy-acetylene welding, but the temperature of the flame is higher, the increase being obtained by adjusting the flame as for welding and then increasing slightly the supply of oxygen. The body of the work must be kept as cool as possible, to insure that the quenching is sufficiently rapid. For small parts it is customary to immerse them in cold water. Bodies of large parts may be left to cool off by themselves, but where necessary a supply of cold water may be allowed to flow over the work. In both cases the actual surface to be hardened is not to be submerged in water unless it is desired to give only a very shallow depth of hardened crust. In calculating the cost, for the purpose of comparison with furnace-treated work, it is pointed out that while for the latter process machining is carried out to approximate dimensions only, so that any distortion due to the heat treatment may be corrected by grinding and straightening, in the local surface-hardening process the work is machined to the finished dimensions, since no distortion is caused.

Internal Small Part Grinding Machine

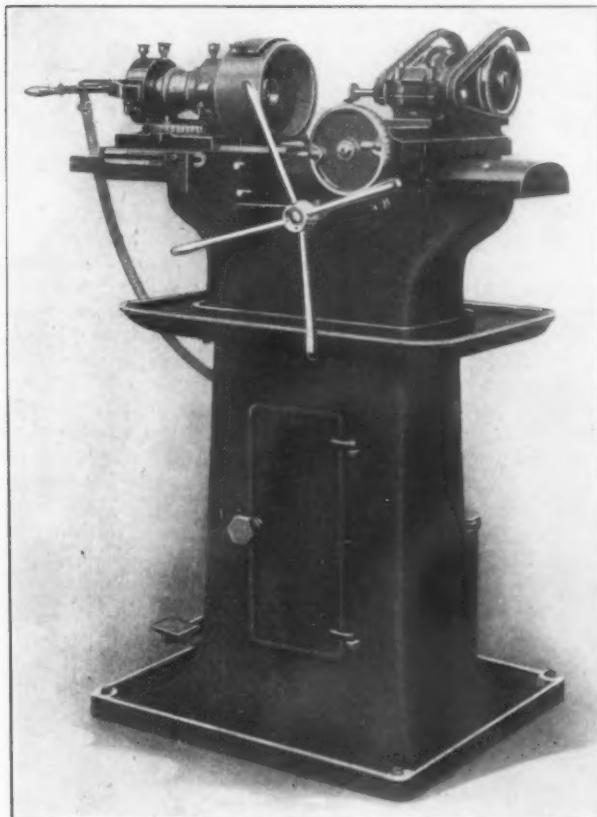
The Lansing Stamping & Tool Company, Lansing, Mich., has brought out a machine for the internal grinding of small parts. It is designed for rapid and accurate production work, such as automobile parts, ball races, bushings, cam rollers, universal balls and other similar lines. Among the features are an automatic control of the work spindle, the use of hand feed and a semi-automatic chucking device.

The pedestal of the machine is a one-piece casting about 29½ in. high and weighing approximately 400 lb. The base is broad and the edges are given a flare which is relied upon to provide stability. The base, which may be bolted to the pedestal or mounted on a bench, weighs about 200 lb.

The table is a single unit fitting in ways on the top of the bed and operated by a rack and pinion arrangement. The work spindle head is located at one end while the other passes underneath the cross-slide table carrying the wheel spindle head. A roll, which engages a dog as the table is moved backward, is located at the rear of the table and is relied upon to operate a clutch arrangement in the countershaft to stop the work spindle when gaging is to be done. This device can also be operated by a foot treadle, it being pointed out that a positive braking action which reduces lost time to a minimum is thus secured, the work spindle stopping as soon as the brake is applied.

The work spindle head is mounted on a plate which is fitted to the table, but is capable of having its position altered by loosening the lock bolts and making such adjustments as may be required. It is possible to set the head at any angle up to a maximum of 90 deg. The work spindle is of high-grade tool steel mounted in ball bearings and has a standard screw thread on the nose to hold the semi-automatic chucking device.

The work is held by a spring collet through the action of a heavy coiled spring on the end of the draw-in sleeve. A slight movement of the lever opens the collet and releases the work, the next piece being inserted in the collet and clamped when the operator releases the lever. The grinding wheel head is composed of two sections, the front portion being formed by the wheel spindle head, while the driving



A Semi-Automatic Chucking Device and an Automatic Foot Control Are Two Features of This Internal Grinding Machine for Small Parts

shaft head forms the rear one. The members are arranged so that the body of the driving shaft head swivels on the base, this arrangement being relied upon to provide the necessary tension for the endless canvas belts used. The adjustment of this head is made by a small handwheel and the grinding wheel head is fastened to the cross-slide table by two bolts.

The countershaft is made in three sections, which are designated as the driving, intermediate and main shafts. The first is connected to the lineshaft by a tight and loose pulley and drives the intermediate shaft by a small wood pulley. This shaft in turn drives the main one by a three-step cone pulley, the work spindle being driven by a drum on the main shaft while the grinding wheel spindle is driven by a three-step loose cone pulley. The speed of the work spindle ordinarily ranges from 50 to 200 r.p.m., while that of the grinding spindle is normally between 15,000 and 30,000 r.p.m., although these may be changed to suit the requirements of the work being handled by replacing the wood pulley driving the intermediate shaft by a smaller one if necessary.

Table for Calculating Tensile Testing Results

A conversion table to save the tedium of calculation of results in tensile testing has been devised by Henry G. Martin, Railway Steel Spring Company, Chicago Heights, Ill. One of these tables is here reproduced from the blueprint form in which he uses them. He emphasizes that the sheet is more accurate than a slide rule, being calculated for an area expressed to the sixth decimal place, and an inspector may carry a

Conversion of BEAM READINGS to pounds per square inch from an original diameter of .750 inch.										
Example: Assume the beam reading to be 56400 lbs. Add together the value of 56000, found at the intersection of the horizontal line beginning "56000" and the vertical line headed "500", paying no attention to the decimal points, and the value of 400 pound at the intersection of the lines beginning "400" and "50", this time regarding the decimals. This sum is 56225 lbs. the value per square inch.										
	10.00	80.00	50.00	40.00	30.00	20.00	10.00	70.00	90.00	
000.00	000.00	22.46	65.27	87.91	96.84	115.18	125.81	189.48	193.08	206.71
100.00	560.00	560.99	571.42	594.26	516.80	339.52	362.17	384.80	407.44	530.97
200.00	1120.00	1121.98	1122.84	1123.62	1124.32	1125.02	1125.72	1126.42	1127.12	1127.82
300.00	1680.00	1681.97	1682.83	1683.61	1684.31	1685.01	1685.71	1686.41	1687.11	1687.81
400.00	2240.00	2241.96	2242.82	2243.59	2244.36	2245.06	2245.76	2246.46	2247.16	2247.86
500.00	2800.00	2801.95	2802.81	2803.58	2804.35	2805.05	2805.75	2806.45	2807.15	2807.85
600.00	3360.00	3361.94	3362.80	3363.57	3364.34	3365.04	3365.74	3366.44	3367.14	3367.84
700.00	3920.00	3921.93	3922.79	3923.56	3924.33	3925.03	3925.73	3926.43	3927.13	3927.83
800.00	4480.00	4481.92	4482.78	4483.55	4484.32	4485.02	4485.72	4486.42	4487.12	4487.82
900.00	5040.00	5041.91	5042.77	5043.54	5044.31	5045.01	5045.71	5046.41	5047.11	5047.81
1000.00	5600.00	5601.89	5602.75	5603.52	5604.29	5605.06	5605.76	5606.46	5607.16	5607.86
1100.00	6160.00	6161.88	6162.74	6163.51	6164.28	6165.05	6165.75	6166.45	6167.15	6167.85
1200.00	6720.00	6721.87	6722.73	6723.50	6724.27	6725.04	6725.74	6726.44	6727.14	6727.84
1300.00	7280.00	7281.86	7282.72	7283.49	7284.26	7285.03	7285.73	7286.43	7287.13	7287.83
1400.00	7840.00	7841.85	7842.71	7843.48	7844.25	7845.02	7845.72	7846.42	7847.12	7847.82
1500.00	8400.00	8401.84	8402.69	8403.46	8404.23	8405.00	8405.70	8406.40	8407.10	8407.80
1600.00	8960.00	8961.83	8962.68	8963.45	8964.22	8965.00	8965.68	8966.38	8967.08	8967.78
1700.00	9520.00	9521.82	9522.67	9523.44	9524.21	9525.00	9525.68	9526.38	9527.08	9527.78
1800.00	10080.00	10081.81	10082.66	10083.43	10084.20	10085.00	10085.68	10086.38	10087.08	10087.78
1900.00	10640.00	10641.79	10642.64	10643.41	10644.18	10645.00	10645.68	10646.38	10647.08	10647.78
2000.00	11200.00	11201.78	11202.63	11203.40	11204.17	11205.00	11205.68	11206.38	11207.08	11207.78
2100.00	11760.00	11761.77	11762.62	11763.39	11764.16	11765.00	11765.68	11766.38	11767.08	11767.78
2200.00	12320.00	12321.76	12322.61	12323.38	12324.15	12325.00	12325.68	12326.38	12327.08	12327.78
2300.00	12880.00	12881.75	12882.60	12883.37	12884.14	12885.00	12885.68	12886.38	12887.08	12887.78
2400.00	13440.00	13441.74	13442.59	13443.36	13444.13	13445.00	13445.68	13446.38	13447.08	13447.78
2500.00	14000.00	14001.73	14002.58	14003.35	14004.12	14005.00	14005.68	14006.38	14007.08	14007.78
2600.00	14560.00	14561.72	14562.57	14563.34	14564.11	14565.00	14565.68	14566.38	14567.08	14567.78
2700.00	15120.00	15121.71	15122.56	15123.33	15124.10	15125.00	15125.68	15126.38	15127.08	15127.78
2800.00	15680.00	15681.70	15682.55	15683.32	15684.09	15685.00	15685.68	15686.38	15687.08	15687.78
2900.00	16240.00	16241.69	16242.54	16243.31	16244.08	16245.00	16245.68	16246.38	16247.08	16247.78
3000.00	16800.00	16801.68	16802.53	16803.30	16804.07	16805.00	16805.68	16806.38	16807.08	16807.78
3100.00	17360.00	17361.67	17362.52	17363.29	17364.06	17365.00	17365.68	17366.38	17367.08	17367.78
3200.00	17920.00	17921.66	17922.51	17923.28	17924.05	17925.00	17925.68	17926.38	17927.08	17927.78
3300.00	18480.00	18481.65	18482.50	18483.27	18484.04	18485.00	18485.68	18486.38	18487.08	18487.78
3400.00	19040.00	19041.64	19042.49	19043.26	19044.03	19045.00	19045.68	19046.38	19047.08	19047.78
3500.00	19600.00	19601.63	19602.48	19603.25	19604.02	19605.00	19605.68	19606.38	19607.08	19607.78
3600.00	20160.00	20161.62	20162.47	20163.24	20164.01	20165.00	20165.68	20166.38	20167.08	20167.78
3700.00	20720.00	20721.61	20722.46	20723.23	20724.00	20725.00	20725.68	20726.38	20727.08	20727.78
3800.00	21280.00	21281.60	21282.45	21283.22	21284.00	21285.00	21285.68	21286.38	21287.08	21287.78
3900.00	21840.00	21841.59	21842.44	21843.21	21844.00	21845.00	21845.68	21846.38	21847.08	21847.78
4000.00	22400.00	22401.58	22402.43	22403.20	22404.00	22405.00	22405.68	22406.38	22407.08	22407.78
4100.00	22960.00	22961.57	22962.42	22963.19	22964.00	22965.00	22965.68	22966.38	22967.08	22967.78
4200.00	23520.00	23521.56	23522.41	23523.18	23524.00	23525.00	23525.68	23526.38	23527.08	23527.78
4300.00	24080.00	24081.55	24082.40	24083.17	24084.00	24085.00	24085.68	24086.38	24087.08	24087.78
4400.00	24640.00	24641.54	24642.40	24643.17	24644.00	24645.00	24645.68	24646.38	24647.08	24647.78
4500.00	25200.00	25201.53	25202.40	25203.17	25204.00	25205.00	25205.68	25206.38	25207.08	25207.78
4600.00	25760.00	25761.52	25762.40	25763.17	25764.00	25765.00	25765.68	25766.38	25767.08	25767.78
4700.00	26320.00	26321.51	26322.40	26323.17	26324.00	26325.00	26325.68	26326.38	26327.08	26327.78
4800.00	26880.00	26881.50	26882.40	26883.17	26884.00	26885.00	26885.68	26886.38	26887.08	26887.78
4900.00	27440.00	27441.49	27442.40	27443.17	27444.00	27445.00	27445.68	27446.38	27447.08	27447.78
5000.00	28000.00	28001.48	28002.40	28003.17	28004.00	28005.00	28005.68	28006.38	28007.08	28007.78
5100.00	28560.00	28561.47	28562.40	28563.17	28564.00	28565.00	28565.68	28566.38	28567.08	28567.78
5200.00	29120.00	29121.46	29122.40	29123.17	29124.00	29125.00	29125.68	29126.38	29127.08	29127.78
5300.00	29680.00	29681.45	29682.40	29683.17	29684.00	29685.00	29685.68	29686.38	29687.08	29687.78
5400.00	30240.00	30241.44	30242.40	30243.17	30244.00	30245.00	30245.68	30246.38	30247.08	30247.78
5500.00	30800.00	30801.43	30802.40	30803.17	30804.00	30805.00	30805.68	30806.38	30807.08	30807.78
5600.00	31360.00	31361.42	31362.40	31363.17	31364.00	31365.00	31365.68	31366.38	31367.08	31367.78
5700.00	31920.00	31921.41	31922.40	31923.17	31924.00	31925.00	31925.68	31926.38	31927.08	31927.78
5800.00	32480.00	32481.40	32482.40	32483.17	32484.00	32485.00	32485.68	32486.38	32487.08	32487.78
5900.00	33040.00	33041.39	33042.40	33043.17	33044.00	33045.00	33045.68	33046.38	33047.08	33047.78
6000.00	33600.00	33601.38	33602.40	33603.17	33604.00	33605.00	33605.68	33606.38	33607.08	33607.78

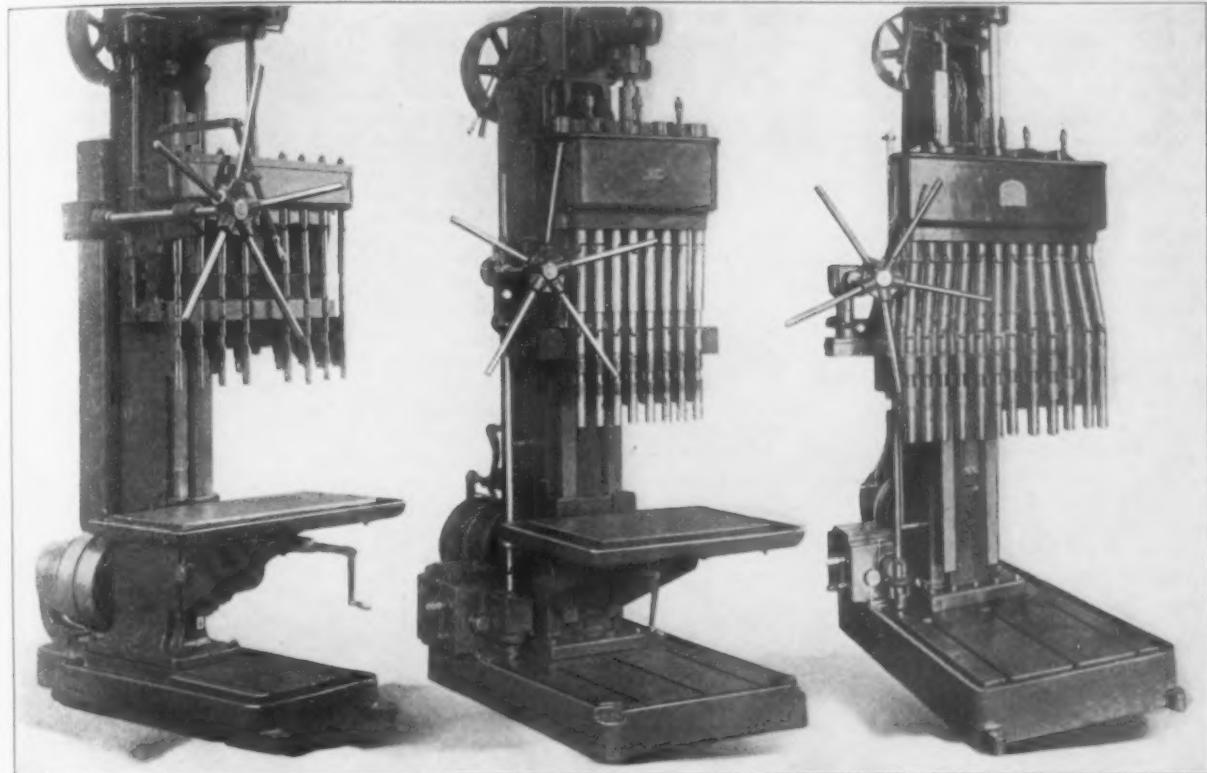
New Multiple-Spindle Drilling Machines

Three sizes of straight-line drilling machines have been added to the line of the National Automatic Tool Company, Richmond, Ind. A number of features are incorporated in these machines which are departures from the standard line. These include independent change of speeds in the rail for each spindle, an adjustment of 3 in. on either side of the center line of the rail and a spot facing attachment.

The independent speed change for the spindle, it is

and 32 in. in length and bored for either six or eight spindles respectively. This machine will drill eight 1-in. holes in cast iron or the same number of $2\frac{1}{2}$ -in. cored holes. It is provided with a 20 x 30 x 32-in. box table or with an adjustable one measuring 29 x 42 in. The weight of this machine is 7500 lb.

The machine at the right is similar to the one in the middle but is heavier, weighing 10,000 lb. The rails for this machine are 32 and 40 in. long and have 8 and 12 spindles respectively. The capacity of this machine is 12 holes, as compared with 8 for the middle



Various Spindle Arrangements with Independent Speed Changes for Each Spindle Can Be Furnished for These Multiple-Spindle Drilling and Tapping Machines as Well as an Attachment for Spot Facing

emphasized, enables large and small holes to be drilled simultaneously at the correct rates, as well as providing a neutral position for such spindles as may not be in use. All of the spindles have a 2-in. vertical adjustment to compensate for tools of different lengths or uneven wear of the tools. The maximum center distance is the diameter of the spindle plus 1/16 in., which, it is pointed out, enables holes to be drilled very close together. An adjustment for the drill spindles of 3 in. on either side of the center line of the rail increases the drilling area to cover a space equal to the length of the rail and 6 in. in width. The spot facing attachment, which is a new feature on the company's line of multiple-spindle drilling and tapping machines, permits multiple spot facing to be done.

The machine at the left of the accompanying illustration is equipped with rails either 24 or 36 in. long, the former being bored for a maximum of 12 spindles and the latter for 16. There are six speed changes, ranging from 363 to 1188 r.p.m., which may be obtained as six single speeds or as three double ones in which the ratio of the low to the high is 1 to 2. A feed box located at the top of the machine provides for three different rates ranging from 1 to 6 in. per min. The drilling capacity of the machine is 12 holes, $\frac{1}{2}$ in. in diameter, or equivalent in cast iron or the same number of $\frac{1}{2}$ -in. cored holes. The machine is driven by a three-step cone pulley mounted on roller bearings, the countershaft speed being 600 r.p.m. The maximum distance from the top of the table to the bottom of the drill spindles is 31 in., while from the top of the base to the bottom of the spindles the distance is 49 in. The table has a working surface of 20 x 40 in. and the machine weighs 4200 lb.

The machine in the center is equipped with rails 26

in. and 32 in. in length and bored for either six or eight spindles respectively. This machine will drill eight 1-in. holes in cast iron or the same number of $2\frac{1}{2}$ -in. cored holes. It is provided with a 20 x 30 x 32-in. box table or with an adjustable one measuring 29 x 42 in. The weight of this machine is 7500 lb.

Machinists' Screwdriver with Square Shank

A special form of machinists' screwdriver has been placed on the market by the Peck, Stow & Wilcox Company, Southington, Conn. The distinctive feature is the square shank that enables a wrench to be employed in turning heavy screws. The tool is of the maker's standard Solbar construction, and is designed for heavy work in machine shops and garages, a single bar of specially tempered screwdriver steel forming both the shank and the handle.

Pneumatic tamping outfits have been adopted by the Lehigh Valley Railroad for packing its rock ballast. Each unit, consisting of four tampers and an air compressor driven by a gasoline engine, is mounted on a self-propelled flat car. The lower end of the tamping bar remains in contact with the ballast, while the upper end is subjected to a rapid succession of hammer blows. Road bed is laid by this method twice as fast as by hand, it is stated, and shows but one-third the usual amount of settlement.

The Kilby Car & Foundry Company, Anniston, Ala., is building a 10-in. straight-train motor-driven rolling mill of 40 tons a day capacity. It will add the manufacture of mine and logging cars to its lines.

The Seasoning of Iron Castings*

Advantage and Importance of Storing to Remove Final Strains—Difference Between Contraction and Shrinkage—Unfairness of Test Bars

BY DR. RICHARD MOLDENKE

ONE of the little-known characteristics of cast iron, which nevertheless has an important bearing on results where accuracy in machining is essential, is the ability of this material to ease up internal strains when allowed to remain quiescent for a more or less extended period of time. It seems as if the molecules in such a casting, by virtue of their "mobility," can adjust their relative positions to an extent sufficient to overcome some of the existing stresses.

The following instance will, perhaps, give a fair idea of the condition a casting may be in when just shaken out of the sand. A very large sheave-wheel, after shaking out, was taken outdoors to be cleaned and made ready for turning up. It was leaned against the side of the building, but before much could be done an arm tore apart with a loud report. Investigation showed that the sun had been shining on the upper rim, thus adding a slight strain to those already existing within the arm and thus overbalancing the strength of the metal in tension. Had this sheave been kept under cover for a while, or at least until machined, the strains would have eased off sufficiently and allowed the sun to look upon it without disaster.

It will not be necessary to multiply examples. Every engineer knows the danger of water-hammer in pipe lines, particularly if the latter are of cast iron. Every mechanic knows, or should know, that it is not good to strike a fitting that is under steam pressure.

Difference Between Contraction and Shrinkage

As to the "internal strains" in castings, or the so-called "casting strains" we hear so much about, we all know that to get a casting reasonably true to the dimensions wanted requires a slightly larger pattern. The usual allowance for gray iron is $\frac{1}{8}$ in. to the foot (1 cm. per meter) and $\frac{1}{4}$ in. to the foot (2 cm. per meter) for white iron (all dimensions). This reduction in length, breadth and thickness in a casting is erroneously called "shrinkage." It should be called "contraction," as for practical purposes it is simply the difference in dimensions of the casting red-hot and cold. In fact, it is really a "volumetric" contraction, and takes place after the metal has set.

The real "shrinkage" covers an entirely different situation. When a casting is poorly designed—thick and thin parts adjoining without special need—and in pouring the mold it is impossible to feed properly, the thinner sections set more quickly than the thick ones and may leave the latter without means of drawing in liquid metal to compensate for the reduction in volume in the act of setting. As the metal sets against the mold walls first, and gradually thickens from the surface inward, when the influx of fresh supplies is stopped there results a void in the center, or at least a spongy portion. This is "shrinkage," and can be seen more particularly in white iron, by reason of its greater reduction in volume from liquid to solid form, apart from the final contraction from red heat to ordinary temperatures. The favorite places for such "shrinkage" are at abrupt angles, in thick parts adjoining thin ones, in the rims of flywheels, hubs of pulleys, at the flanges of cylinders, etc. The correction of the trouble is not germane to this article.

It will be seen from the above that there are really two kinds of reduction in volume to be reckoned with: First, that due to the change from the liquid to the solid state; second, the reduction in volume after setting until ordinary temperatures have been reached. The first, often called "interior shrinkage," is a rather

serious thing. The specific gravity of molten iron is about 6.65, and does not vary widely from this figure whether the metal on setting is gray or white in fracture—all the carbon being combined when in the molten state. On setting, however, if gray iron results the specific gravity will be over 6.8, and if white iron, up to 7.8—the formation of graphite in the structure accounting for the comparatively moderate increase in the case of gray iron. In an average cast iron, with 7.3 specific gravity, the increase in density is 0.65, or 9 per cent—which means a very big decrease in volume for equal weights of molten and solid metal. This situation accounts for the quantities of molten metal that have to be added to a mold after pouring it full in the first place, and in the case of small castings—particularly when of white iron—for the funnel-shaped sprue left in the pouring basin or gate.

Contrast this with the eventual reduction in volume after setting. Here we have a linear reduction of about 1 per cent in every direction, or say a 1-in. cube taken from a cube the sides of which are 100 in. each. An infinitesimal accomplishment as against the real metal shrinkage.

It stands to reason that if the metal in setting has the power to pull apart whatever liquid material may remain after feeding has stopped, and thus give large spongy parts in the interior of a casting, there must have been set up powerful strains which affect the strength injuriously. This is apart from the reduction of strength in the material for the section itself. In other words, not only will the metal have a smaller tensile strength because of the spongy nature of part of the section, but the interior strains counterbalance part of the tensile strength that is available.

This situation is intensified by the fact that the metal in setting does so far more quickly at the mold surface than in the interior—the cold sand walls drawing away the heat from the molten iron more quickly at the beginning of the setting process than later when this heat has to travel through a more or less thick shell of metal already set. The consequence is a higher percentage of combined carbon at the surface than in the interior of the casting. In the extreme case—that of chilling the surface—we have a white iron surface and a gray iron interior. The relative change in the specific gravities of the same molten iron turned into two extreme forms of iron as cast will indicate what strains there must be within the casting in question due to the differences in volume which the two metals want to occupy when set but cannot properly occupy on account of the quickness of the setting action.

Finally come the strains due to the contraction in the set material until ordinary temperatures have been reached. This has been stated as $\frac{1}{8}$ in. to the foot in gray iron (about 1 per cent), and $\frac{1}{4}$ in. to the foot in white iron (about 2 per cent). In large castings this is very serious. Suppose, in the case of a big flywheel, the rim sets fast enough to hold the much cooler arm as in one set of jaws of a testing machine, the hub held by the arms on the other side of the wheel—being the other set of jaws. Surely the arm in wanting to reduce in length $\frac{1}{8}$ in. to the foot (1 cm. per meter) must be under a terrific strain if not allowed to do so. In the case of white iron the situation is much worse, such castings as handbrake wheels (subsequently annealed for malleable castings) snapping apart when allowed to cool in the sand in the ordinary way. Such work must be shaken out as quickly as set, taken to special ovens and allowed to cool down very gradually.

Sufficient has been said to make the case of cast iron look very weak. Fortunately, there are two phenomena which help to overcome some of the injurious strains

*From a paper to be presented at the February meeting of the American Institute of Mining Engineers, New York. The author is a consulting metallurgist, Watchung, N. J.

set up. The first is the fact that cast iron—particularly gray cast iron—in the act of setting (between liquid and solid) can be stretched. The second is the before-mentioned "seasoning" or easing up of the remaining strains after the final contraction—through the mobility of the molecules. It is the stretching of gray iron during the setting that saves the flywheel arm from rupture before the new strains due to final contraction are introduced. It is the inability of white iron to stretch very much which makes for so many cracked castings in the malleable process which would not be seriously affected by the final contraction.

Unfairness of Test Bars

The above discussion of the actual situation in making castings has another bearing. Purchasers of castings may wonder why foundrymen who really know something about their basic material are so uncompromisingly opposed to test coupons on their product. The arguments given above should convince the man who is at least somewhat familiar with cast iron that it is unfair to the maker of the casting to judge its value by a test piece subject to a variety of strains introduced as the result of position, manner of attachment, method of pouring of the metal, etc., of the mold. It is further unfair to the purchaser—if he only knew it—to judge by coupons, as there are many ways of artificially strengthening such test pieces. There is only one way of testing a casting properly, and that is to break it. Obviously this will not do, and hence for repetition work a given percentage of castings can be thus tested. For all other cases the only method of obtaining a reasonable assurance on the subject is the making of standard test bars, entirely apart from the castings but of the same iron, and making these test bars under conditions giving the iron the best possible chance to show just what it is, neither artificially strengthened, nor filled with strains and thus deliberately weakened.

Importance of Seasoning Castings

This brings us to the real object of this note. Every mechanic knows that in planing up a slab of cast iron on both sides to get a true job it is necessary to take a light cut, reverse, and take a cut on the other side, then reverse again for the finishing cut, finally reversing for the last cut. If this is not done there will be warped surfaces to deal with on account of the internal strains. Again, it is well known that to get a true piston is a rather difficult matter. Even after grinding to a finish it is apt to get out of true. It is not so generally known, however, that if such a cast-iron plate or piston is allowed to remain in storage for a long period, the results will be much more satisfactory. The castings have "seasoned." Where establishments are familiar with the situation, orders for castings are placed far ahead of requirements. Since, however, on getting to the bottom of a big pile the difficulty of tracing defective work becomes correspondingly harder, only shops having their own foundries are likely to do much storing.

The present demand for very high-class machined castings, as evinced by automobile cylinders, pistons, engine and compressor cylinders, etc., should bring this question of "seasoning" out very prominently. Inquiry by the writer has shown but little knowledge on the subject in the trade generally, though where first-class foundrymen were connected with the industries involved, these were very much alive to the matter. In general, the difficulty seems to be the inability of storing up ahead, or when so doing of striking defective product when least expected, particularly in such cases as castings for piston rings, etc.

For what seems the best indirect explanation of the "seasoning" action, we are indebted to the well-known metallurgist, A. E. Outerbridge, Jr., who in his famous experiments on "tumbling" castings to increase their strength, found that by the action of light blows, often repeated, the internal strains were relieved to such an extent that the real value of the metal came into play. The "mobility" of the molecules was aided by artificial

means. Incidentally, however, the tests establish the "mobility" of the molecules in cast iron very satisfactorily. Replace half-an-hour's tumbling by 6 months' quiescence and the molecules will have done their work with somewhat the same results.

In view of the possible depression scheduled for this country on the close of hostilities in Europe, would it not be well to ease up operations slowly instead of shutting down tight? This would help the industrial situation adjust itself more safely and at the same time stock up supplies of castings which will be all the better for having seasoned. Inasmuch as similar improvement has been noticed in the case of ingots, billets and other iron-base products, the same argument would hold.

The writer presents this memorandum in the hope that a discussion may bring out present practice and possible applications with respect to an almost unknown but highly valuable characteristic of cast iron and allied materials.

W. M. Bailey Assistant to President Dinkey

Announcement is made of the appointment of William M. Bailey as assistant to A. C. Dinkey, president Midvale Steel Company, Cambria Steel Company, Worth Brothers Company and Wilmington Steel Com-



WILLIAM M. BAILEY

pany, the appointment becoming effective Feb. 1. Mr. Bailey will have charge of accidents and workmen's compensation, safety and welfare, labor, real estate and housing, police, insurance, contributions and such other matters as may be assigned to him. He will have the large and important task of organizing an entirely new department of the combined companies.

Mr. Bailey was born in Pittsburgh in 1881. He attended the public schools in that city, and worked several years in the glass business in the Pittsburgh district before entering the service of the Carnegie Steel Company in 1900. His first employment with the latter company was as a messenger in the office of assistant to President Homer J. Lindsay. On March 1, 1906, he was transferred to the office of President A. C. Dinkey as a stenographer, and a year later assumed the duties of secretary to the president. He left the Carnegie Steel Company Oct. 1, 1915, upon the formation of the Midvale Steel & Ordnance Company, but continuing in the same capacity as before. Walter H. Lewis has succeeded Mr. Bailey as secretary to President Dinkey.

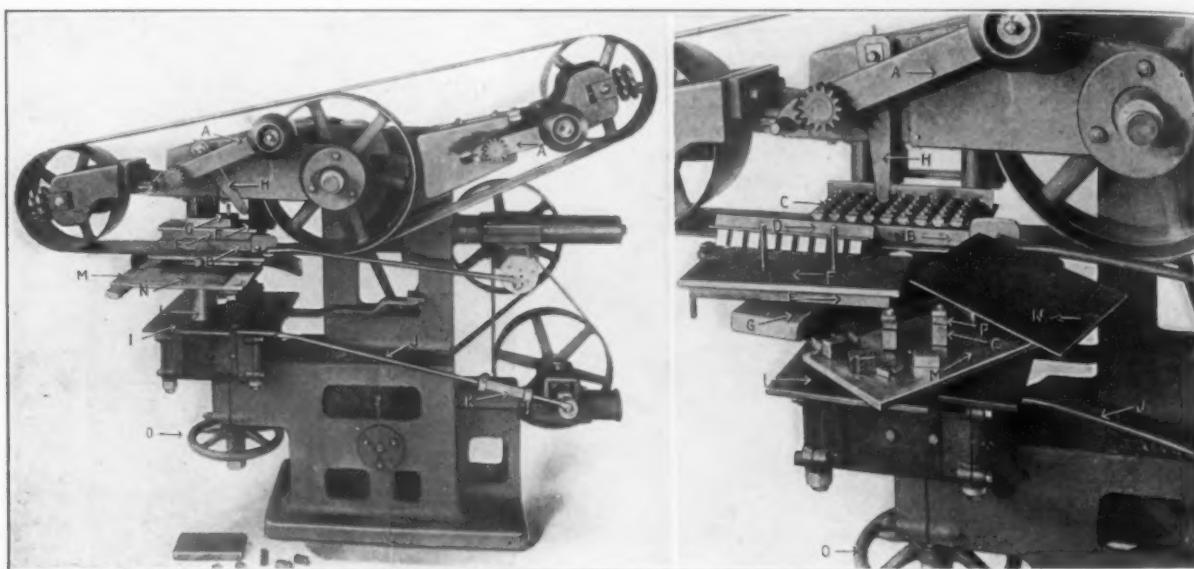
TWO-BELT FINISHING MACHINE

Turret Arrangement Employed in Finishing Flat Surfaces of Dies, Hinges, Etc.

A finishing machine of the two-belt type equipped with a turret attachment has been brought out by John C. Blevney, Newark, N. J. It is designed for finishing flat surfaces, such as lock fronts, hinges, striking plates, sash lifts, escutcheon plates, planer blades, cutting dies, etc. The use of a turret arrangement enables one set of parts to be finished by the machine while another lot is being removed and a third one made ready. It is emphasized that this gives an increased production, an average of five times as compared with that formerly possible being claimed. The output of the machine is gov-

is transmitted through the rubber cushion, cause the belts to conform to the irregularities or shape of the work and, it is explained, press harder on the high points of the work than on the low ones so that in the grinding action of the belts the high points will be cut down while the lower ones are less affected, the reciprocation of the platen being relied upon to help this action.

The side oscillating table *I* is located underneath the belts and has the length of its oscillations varied by the crank *J*, a screw adjustment *K* providing for centralization with relation to the belts. The turret *L*, which has an H-shaped face and holes in the bar extensions, is placed on the table. The tables of the machine *M* have pins registering with holes in the turret and a set of holes that are relied upon to engage with corresponding pins and hold the work holding plate *N* which has pins or bars to



A Cushion and an Abrasive Belt in Conjunction with an Arrangement for Removing One Lot of Small Flat Articles Such as Dies, Hinges, Locks, Etc., While Another Is Being Finished Enables a Marked Increase in Output to Be Secured from This Machine

erned by the time it takes to finish the number of pieces on the table in relation to the time consumed by the operator in removing the finished pieces of work and reloading the plate.

The machine is of the builder's standard two-belt type which was illustrated in another form in THE IRON AGE, Feb. 25, 1915. It has a cushion belt running over two pulleys with an abrasive belt running over this and a third pulley, the proper tension being maintained by the levers *A*. The essentially new feature of the machine is the platen *B* formed of bars between which the hardened mortised platen blocks *C* that are kept from contact with one another by separators move freely up and down. The platen lock *D* holds the separators and the blocks in position. These blocks have projections at the top of a predetermined size in relation to the contact surface. A rubber cushion *E* is laid over the blocks and the rubber cushion holder *F* is placed above this in turn. The pins on the holder are employed to hold the weights *G* required to supply the pressure in grinding. A lever *H*, when in the position shown at the left of the accompanying illustration, holds the platen from contact with the belts and stops the grinding or finishing. When in the position shown at the right, the platen is bearing against the belt. The platen is reciprocated by a crank capable of adjustment to give more or less movement.

With the belts resting on the work the platen blocks, under the pressure of the weights which

keep the work from sliding sideways, the belts being relied upon to hold it down.

In operation the work is placed on the plate *N*, the lever *H* being in the position shown at the left. The turret is then rotated to bring the work under the belts and the lever *H* is thrown to the opposite position. The setting wheel *O* is manipulated to cause the work to press the belts and the platen blocks upward until the upper edge of the mortise *P* will have the proper limit finishing distance in its relation to the adjoining bar of the platen. In other words, the descent of the blocks is limited by the amount of stock to be removed, as when the upper edge of the mortise and the adjoining bar are in contact no further finishing can take place. The work of finishing is now begun and while this is being done the second plate is filled with another lot of work. When the first lot is finished the lever *H* automatically swings into position to hold the platen from contact with the belts. The finished pieces are then removed, while the second lot is substituted and the work of grinding continued.

The Mason washer and specialty making machines for utilizing scrap plate formerly built by the Joseph M. Mason Machine Company, Philadelphia, are now built and sold by the Southwark Foundry & Machine Company of that city, which has been appointed the sole authorized builder and agent. All inquiries and orders for machines and parts in the future should be sent direct to the Southwark Company.

FACTORY WINDOW SASHES

Features Which Economize Heat and Eliminate Condensation on the Glass

THE radiation of heat through various types of window sashes and the prevention of condensation in double-glazed sashes formed the subject of a paper by Arthur N. Sheldon, presented at the annual meeting of the American Society of Mechanical Engineers in December, 1916. The paper described a series of experiments conducted by W. S. Brown under the direction of the author in which sashes of various descriptions were fitted over an insulated box. The temperature on the interior was maintained at definite figures during the course of the experiments by means of an electric heater. The temperature outside of the box was also maintained at a predetermined point by means of electro-thermostatically controlled steam radiator. Constant difference of temperature or "heat head" conditions on two sides of the sash were thus established and the rate of transmission determined for each type of sash at several sets of temperature differences. Table 1 presents the conditions of several experiments and also the results as to heat transmission and condensation.

Glazing Single or Double	Size of Sash	Thickness of Panes, In.	Arrange- ment of Panes	Per Cent Air of Glass	70 Deg. Temperature Difference				40 Deg. Temperature Difference				
					High	Wide	Air of Glass Space, Area In. Exposed	H	Humid- ity	Condensation	H	Humid- ity	Condensation
1S	Steel	12 x 18	1/4	5	4	3/16	85	33.6	28	All	28.5	36	None
2D	Steel	12 x 18	1/4	5	4	3/16	85	21.6	29	15 outer panes	20.5	34	None
3D	Steel	12 x 18	1/4	5	4	3/16	85	24.0	30	1 outer, 1 in- side pane	22.5	43	Slight on 1 outer and 1 inner pane
4D	Wood	12 x 18	1/4	5	4	5%	85	15.1	31	None	13.9	49	None
5S	Wood	12 x 18	1/4	5	4	5%	85	29.3	29	12	25.5	44	Practically none
6D	Steel	14 1/2 x 21	1/4	4	3	5%	71.5	16.4	36	1 outer	15.2	54	1 outer pane
7S	Steel	14 1/2 x 21	1/4	4	3	..	71.5	29.7	25	All	26.4	43	All

The transmission of heat through a sash is designated as H and is expressed on the basis of the B.t.u. transmitted for 24 hr. per degree Fahr. per square foot of opening. The values of H for temperature differences, ranging from 40 to 80 deg. Fahr. and for the entire set of experiments are plotted in the accompanying chart.

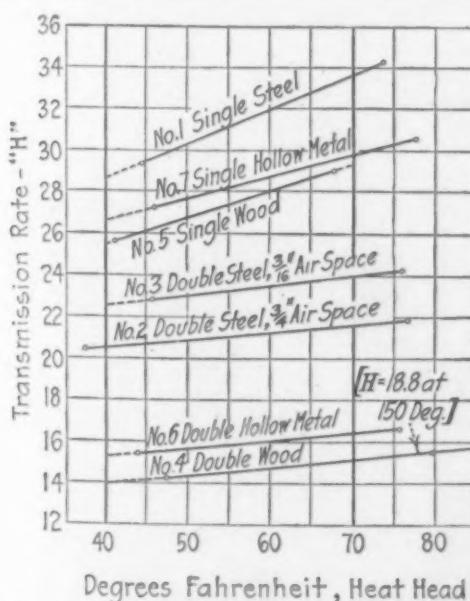
In order to emphasize the practical application of the experiments, the author presented a typical problem in the design of reinforced concrete buildings. The

heating season was 35 deg. The heat delivered per pound of coal was 8500 B.t.u., and the length of the heating season was 4850 hr. The assumed cost of hot-water heating plant per square foot of heating surface including the heater was 60 cents, based on minus 10 deg. Fahr. outside temperature and a cost of coal per 2000 lb. of \$4. The question to be answered was whether it would be more economical to use single or double glazed sash and, if the latter, what depth of air space

Glazing	Air Space, H. In. B.t.u.	Yearly Bill	Initial Expenditures—		
			Sash	Heating	Total
A. Single	27.7	\$1,750	\$15,600	\$11,040	\$26,640
B. Double	3/16 22.3	1,410	21,000	7,680	28,680
C. Double	5/8 20.0	1,260	25,750	6,900	32,650

would be most economical. Table 2 summarizes the results of the three propositions.

From this table it is evident that an investment of \$2,040 for B over A would result in an annual saving of \$340 worth of coal or 17 per cent gross on the additional investment. Also an additional investment of \$6,010 for C would result in an annual saving of \$490 worth of coal or only 8 per cent on the additional investment. The choice, therefore, lies between A and B



For different types of window glazing, the number of British thermal units transmitted in 24 hr. per degree Fahrenheit difference in temperature per square foot of window area—factor H—may be determined from the curves

wall openings to be glazed aggregated 37,800 sq. ft. The average inside temperature to be maintained was 70 deg. Fahr. and the average outside temperature over

and the final decision depends upon the earnings the owners expect to make on other investments. With a different unit cost of coal, a warmer or cooler climate or a different heating system, the conclusion might be entirely changed.

In regard to condensation, the following conclusions were reached: Condensation in the air space of double-glazed sash can be eliminated almost entirely by connecting the air space directly to the outside air by a small breathing hole, and at the same time effectively sealing it from the entrance of warm air within the building. In attempting the design of a double-glazed sash according to these principles, it is suggested that the following points be considered:

- The opening should be very small, say a 1/4-in. hole, to prevent a direct loss of heat by convection from the air space.
- The location of the breathing hole is immaterial, except that a consideration of heat economy makes the bottom preferable.
- The breathing hole should be protected from the weather and dirt.
- A high-grade elastic putty should be used. On account of wind pressure, difference of expansion between steel and glass (about 65 per cent), careless setting, etc., absolute sealing of the inner panes probably will not be accomplished. However, these tests show that a sufficient degree of tightness can be obtained, and that the larger part of the breathing will occur through the opening made for this purpose.
- Leaks between air spaces should be eliminated.

An organization of employees in the Portsmouth, Ohio, works of the Whitaker-Glessner Company has been formed known as the Whitaker-Glessner Fellowship Club. The plans are to provide a building fitted with an assembly hall, pool and billiard tables, social rooms, shower and tub baths, gymnasium, etc.

NEW POWDERED COAL PROCESS*

Correct and Intimate Mixture of Coal and Air Secured in a Carbureter

THE development and perfecting of means and processes of preparing and burning powdered coal have been along the line naturally to be expected; that is, from an effort to burn fine slack by blowing it over or upon the surface of a burning fuel bed by use of a steam jet, and later by crushing or pulverizing the coal to what at that time was considered a fine size, blowing it into the furnace with part or all of the air necessary for combustion and burning in suspension, to the present standard of pulverizing so that not less than 85 per cent will pass through a 200-mesh screen and be thoroughly intermingled in a carbureter with the proper amount of air for perfect combustion before discharging into the furnace. The advantage of drying coal down to 1 per cent or less moisture to burn in powdered form to the best advantage was not fully appreciated. The drying originally was done in an effort to bring the coal to a better condition for pulverizing rather than to realize the beneficial effect it would have in its burning. A full appreciation of the need to have the coal dry and fine led to the development of the drying and pulverizing equipment to a point which leaves little more to be desired.

In the carburetor process the mixing of the pulverized coal and air is done in a casing containing two chambers, with an auxiliary supply of air which comes into the second chamber and is there mixed with the coal-laden air in such a way that the intermingling of the coal and air is carried to completeness. The apparatus is called a carbureter, and from this the coal passes directly to the burner, at the mouth of which it is burned, the velocity of the air always being greater than the rate of flame propagation.

Speed control of the feeding worm, as well as adjustment of the air valves, is synchronized where the Archimedean screw is used, so that when it is desirable to increase the feed of coal, the supply of air is proportionally increased automatically, or decreased, as the case may be. If the proper relation of the synchronizing members has once been established, the amount of coal burned per unit of time may be increased or decreased with positive assurance of perfect combustion even though handled by ordinary labor.

In the use of air pressure control for removing the powdered coal from the hopper, the valves controlling the auxiliary air are synchronized with the air pressure valves used in the hopper in such a manner that the mixing of the coal dust and air is made complete in the carburetor before being introduced into the furnace.

It is of course understood that in the development of a new art many ways of accomplishing things are devised and different degrees of attainment result. This has been true in the development of powdered coal. Some methods in its early use naturally were crude, but the manner of use which ultimately will become a standard, from the fact that it will bring about the greatest economy and efficiency, is that which not only supplies the exact and proper amount of air with the coal for complete combustion when discharged into the furnace at the burner, but which also carries the mixing of the coal and air to a point at which there is no question that each particle of fuel will be brought into contact with its proper amount of oxygen. Added to this must be an arrangement by which the coal and air, after being thus intimately mixed, will be delivered to the burner without opportunity for the coal particles to settle before their discharge with the air into the furnace.

Some systems of using powdered coal require an excess amount of air, nearly equal to that needed for a grate fire. If means are at hand whereby each particle of fuel can be brought into touch with the proper amount of oxygen there will be no need of excess air,

and greater economy and efficiency will result. Powdered coal affords this means, but until the carburetor process was brought out, full advantage was not taken of this possibility. This can only be appreciated when attention is called to the fact that when coal is pulverized to such a size that 85 per cent will pass through a 200-mesh screen, there will be exposed to contact with the air more than 1872 sq. in. of surface, as compared with 6 sq. in. of surface exposed in an original 1-in. cube before pulverization. A 1-in. cube pulverized as above will produce over thirty-five and one-half million cubes or particles, and from this fact it will be seen that the degrees of intimate mixture of coal and air particles may extend through a very wide range.

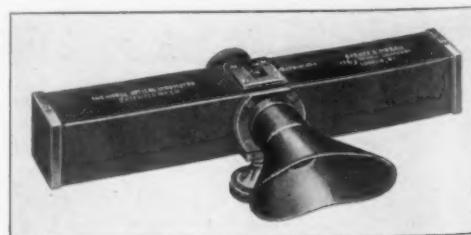
The gratifying results secured in burning powdered coal when properly dried and pulverized, as compared with burning on grates, have been such as to lead some to believe that the ultimate of perfection has been reached, and efforts to carry the mixing of coal and air still further have been abandoned as useless. That this is a mistake is confirmed by the results obtained in the carburetor process. Tests have been made in which the highest temperature and gas analysis have been found to exist within 2 to 3 ft. of the burner, showing that combustion is almost instantaneous and is complete within this short space.

The Slag Question

Research work develops the fact that where the proper amount of air is supplied and intimately mixed with the finely powdered coal, trouble from slag formation is reduced to a minimum, and really becomes a negligible quantity. The reason for this is that the mechanical combination of the coal and air is carried to such an intensified point before entering the furnace, that when it does reach the furnace, the chemical combination of the oxygen of the air with the fuel elements of the coal takes place almost instantly, with the result that not only does perfect and instantaneous combustion ensue, but slag formation is almost instantaneous and is confined to the zone within a few feet of the burner, and its control and disposal become simple even with coals that have a high ash content. The per cent of ash in coal does not necessarily indicate in all cases the amount of trouble to be expected from slag. On the contrary, due to the different elements entering into the make-up of the ash, a low ash coal may be more troublesome than one having an excessively high ash content but a different and favorable combination of elements.

A New Form of Optical Pyrometer

Barnes & Morris, London, England, have placed on the market an interesting form of optical pyrometer. The instrument is intended for use in any case where the heated body is visible, either directly or by reflection, the fields in which it can be employed including



A Prism of Specially Prepared Dark Glass Capable of Being Moved Through the Field of Vision Until the Color Disappears Indicates the Temperature in This Optical Pyrometer

the heat treatment of metals, and in foundries and steel plants.

The instrument consists of a brass tube with a small telescope arranged so that the objective of the telescope focuses the image of the heated body on a movable prism inside the tube. The image on the prism magnified is revealed to the observer through the eyepiece of the telescope, a suitable shield being provided to prevent exterior light from reaching the eye.

The prism is made of a specially prepared dark

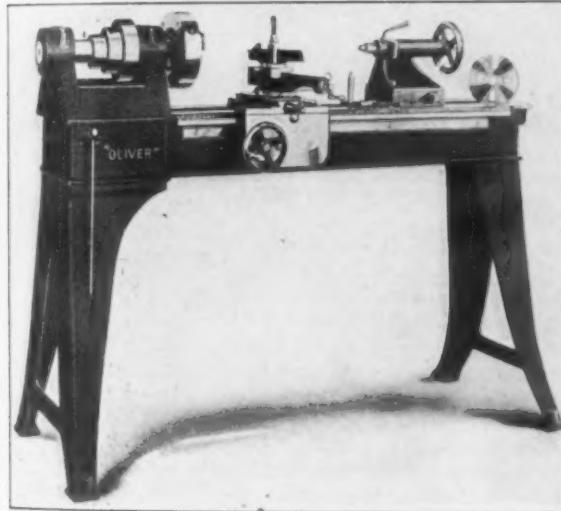
*From a recent paper by Alonzo G. Kinyon, consulting engineer, Powdered Coal Engineering & Equipment Company, Chicago.

glass, arranged to cut off the light emitted by a heated body at various temperatures and capable of being moved through the field of vision by a rack and pinion actuated by a milled head at one side of the tube. As this screw is turned the thicker portion of the prism comes gradually into the field of vision, and the article, the temperature of which it is desired to measure, appears to become gradually darker in color until the color disappears entirely. The position of the prism measures the temperature and by referring to the scale at the top of the instrument the reading can be obtained.

A 12-In. Speed Lathe with Belt Drive

A 12-in. speed lathe equipped with belt or motor drive has been placed on the market by the Oliver Machinery Company, Grand Rapids, Mich. It has a four-step cone pulley, a hand-feed carriage with compound swivel rest and a set-over tailstock. The lathe as regularly built has a bed 60 in. long, which enables work 36 in. long to be mounted between the centers, the swing being 12 in. over the bed and 9½ in. over the carriage.

The headstock is 12½ in. long and 10½ in. wide and has adjustable split bronze bushings grooved on the inside for oil passage, the lubricant being supplied by ring-oiling devices from oil wells having both level and drain plugs. The end thrust is cared for by the ends of the cone pulley pressing against the bronze bushings, the adjustment being made by expanding the cone. The smallest step of the pulley is fastened securely to the spindle and is threaded into the remainder



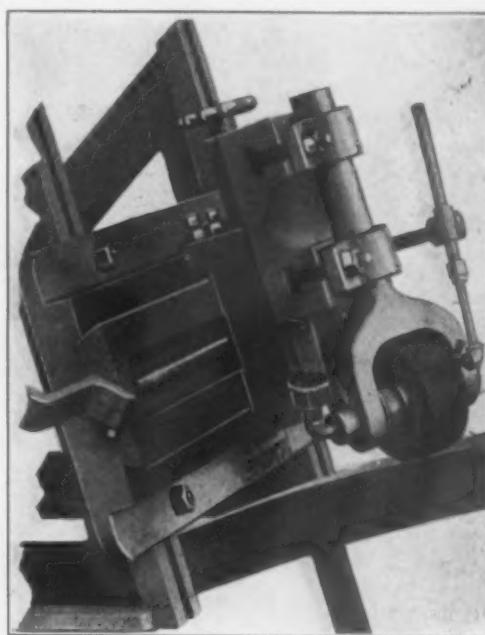
Work up to 12 In. in Diameter and 36 In. Long Can Be Handled by This Speed Lathe While Attachments Enable Boring or Recessing to Be Done

of the cone pulley. The steps of the pulley range from 3½ to 6½ in. in diameter and are 1½ in. wide, the speeds available ranging from 700 to 2800 r.p.m. The spindle has white bronze ring-oiling bearings 3 in. long that are adjustable for wear. The spindle is 15 in. long with a ½-in. hole extending through it and bored for a No. 2 Morse taper.

The bed is a cored casting 6½ in. deep, 6¾ in. wide and 60 in. long. The top is planed flat and the inside edges are machined to act as ways for the head and tail stock. A hand-feeding carriage and compound swivel rest are regularly furnished, but these can be omitted and a plain bed furnished if desired. The ways for the carriage are cast on the side of the bed and two iron brackets are fastened on the back to support a tool rack. A hand-feed tool carriage with cross-feed and compound swivel rest is regularly furnished, the latter carrying a slotted tool post and having a traverse of 3½ in. The apron has a bearing of 10 in. on the bed and a travel of 37 in. A cut steel rack and pinion actuated by a handwheel provides for its movement. The tailstock is of the open side design secured to the bed by a positive clamp. A set-over device is furnished for taper work.

Portable Bandwheel Grinding Machine

A portable grinding machine for refacing bandmill wheels in sawmills has been developed by W. C. Barnhart, Seattle, Wash. This work is done without removing the wheels from their bearings, and another application of the principle is to pulley or cylindrical grind-



Refacing Bandwheels in Saw Mills Without Removing Them from Their Bearings Is One of the Applications of This Portable Grinding Machine

ing where the surface to be ground can be driven at a peripheral speed of from 5000 to 9000 ft. per min. The use of this device, it is emphasized, enables the wheel to be ground in one-quarter of the time usually required.

The grinding wheel is held against the surface being ground at an angle with respect to the axis of the pulley and is revolved by the friction of the grinding action. The wheel has no independent drive, as is the case with the belt or motor driven grinding wheel, but is simply revolved by frictional contact with the surface being finished. It is pointed out that the reason for the high efficiency of the machine lies in the ability to secure a normal grinding action at high speed which permits a correspondingly fast feed across the face of the pulley. To secure this action the differential speed between the work and the abrasive wheel should be about 5000 ft. per min. Varying the angle of the abrasive wheel with reference to the axis of the pulley produces a slower or faster rate of revolution of the wheel in proportion to the speed of the pulley.

All Rifle Manufacture Subject to Tax

The Commissioner of Internal Revenue has notified the manufacturers of firearms of his ruling that the munition tax law applies to all firearms of every description, whether used for the purposes of war or otherwise. Makers of such arms as sporting rifles, shotguns and various other types of weapon never used in connection with armies and navies had argued before the commissioner that these products should not be included under the same head as army rifles, machine guns, etc.

An apparatus has been invented by Edwin E. Slick, Johnstown, Pa. (U. S. 1,206,150), which is particularly adapted to the stripping of steel ingots, the larger ends of which are upward. The method consists in lifting the molds containing the ingots from their supporting stools, placing them and holding them firmly while the lower end is exposed and then pushing the ingot upward and partly out of the mold. It is then grasped by its upper end and removed.

The Foreign Trade Aspect of the Tariff*

Bargaining Features of the Highest Importance in View of New European Alignments—Duties May Limit Exports

BY WILLARD STRAIGHT

The treaty fabric under which the major part of the trade of the world was conducted prior to 1914, with its wide extension of "favored nation" treatment, has been virtually destroyed by the war. Our own commercial arrangements with the belligerents have not been altered, but we have at present no commercial treaty with Russia. Our relations with some of the other powers rest on bases which are antiquated or improvised. In any case the belligerent powers will necessarily recast their arrangements with the United States to conform to the provisions of the instruments on which their own mutual relations will be based. The tariff systems of the world will be revised to meet new conditions. To pay interest on enormously increased national debts, tariff duties as well as direct taxation must be increased. To endeavor to obtain the sums required merely by fresh taxation would be to place an undue burden upon capital and industry. Fresh wealth must be created by the development of productive power. Such stimulated production must of necessity find an outlet in the export trade.

British Tariff Policy

Although Great Britain has not as yet ostensibly departed from her traditional free trade policy, duties have been increased, charges have been imposed on articles hitherto admitted free, and the importation of others has been prohibited. These changes have been made to raise revenue, to curtail luxury and to give additional space on British ships for the transportation of necessities. But there has been a noticeable trend toward the idea of a tariff for protective purposes. It seems possible, therefore, that a tariff or economic partnership between the United Kingdom and the British colonies, and preferential arrangements between the British Empire and the Entente Allies may be established. Similar arrangements may be made by the Central Powers. The three Scandinavian nations entered into a comprehensive trade agreement in July last. The difficulty of reconciling conflicting interests may make these combinations unworkable in their most extreme form; but the fact that they are contemplated is significant and must not be disregarded. We do not know what will happen, but whatever it is we should be prepared to meet it. For example, in order to secure the trade of South America, the United Kingdom may be willing to offer South American countries concessions impossible when the United Kingdom was a free market but feasible under a system of reciprocity which a British tariff would permit. Under possibly broader preferential arrangements between the Entente Allies or the Central Powers, South American countries may be able to obtain from them preferential rates in return for reciprocal advantages. Offers of this sort, coming from either allied group, would be particularly attractive because of long established trade relations, especially with England, Germany and Italy, and because of the large investment which these nations and France have made in South America.

If the European groupings, as a result of the war, are either collectively or individually to utilize bargaining tariffs as they have in the past, under their maximum and minimum, or general and conventional systems, it is essential that the United States should be in a position to protect its interests. The Entente Allies, for example, apparently contemplate post-bellum discrimination against the trade of the Central Powers. It has been stated that every effort would be made to continue close commercial relations with the neutral na-

tions. Will the maintenance of such relations, however, be made contingent upon the willingness of neutrals to discriminate against German trade? The best method of avoiding such a dilemma is to realize that it may arise. If this or other equally difficult situations are possible, should we not now consider measures which will render them improbable?

A Bargaining Tariff

The trend of economic policies in Europe is manifest. The need for maintaining our export trade is obvious. The United States will be the richest market in the world after the war. The United States will be the most serious competitor which European industry will be obliged to meet in its campaign for recouping the losses of the present struggle. This war has demonstrated the fact which some of us in this country have heretofore been disposed to ignore—that international trade, like domestic trade, is essentially an exchange of commodities. We cannot hope that we shall continue to sell some \$3,000,000,000 more of goods than we buy. Commercial relationships to be permanent must be mutually advantageous. If we wish to sell our goods abroad, we must in turn purchase from foreign producers. Our purchasing power, therefore, is our first line of economic defense. To utilize it as such we must be able intelligently to regulate the importation into this country of goods which other nations desire to sell to us. By so doing, we may demonstrate the advantages which they may gain by purchasing articles which we in turn desire to export. We need a "bargaining" tariff. A "bargaining" tariff to be effective should be flexible. It should be possible to apply its provisions to meet situations as they arise. Our present tariff laws are inadequate from both points of view. Whatever be the underlying principle of the tariff it should possess adequate resources for the encouragement of our foreign trade and its protection from undue discrimination. . . . A tariff law may be so framed that within certain specified limits fixed by Congress, the Executive may utilize the tariff either to secure concessions for American trade or to prevent discrimination against our products, or our interests in foreign lands.

Congress, in connection with various tariff bills, has from time to time contemplated the "bargaining" potentialities of the tariff. This phase of the problem, however, has received but small consideration from our legislators. The maximum and minimum provisions of the Payne-Aldrich Tariff were debated by the Senate for less than an hour. This subject has not formed the basis for public discussion since the time when immediately after the Napoleonic wars our markets were flooded with British manufactures, and our trade discriminated against by the nations of Europe.

The tariff may be utilized for the encouragement of export trade in either or both of two ways—through reciprocal tariff concessions, or by the threatened application of retaliatory measures to prevent discriminations. The United States in the past has availed itself of both methods.

[The author here reviewed the bargaining provisions in previous tariffs.]

The Present Tariff

The amendments to the Underwood bill, discussed and adopted by the Senate but not concurred in by the House of Representatives, vested in the Executive power to retaliate in the case of discrimination against our products, either by the increase of duties on certain specified dutiable articles or by the imposition of duties on certain specified articles on the free list. Under our

*From an address before the fourth National Foreign Trade Convention, Pittsburgh, Jan. 25, 1917.

present tariff, 60 per cent of the articles imported into this country are admitted free of duty. Ninety-five per cent of the value of imports from South America, with the exception of Cuba the same proportion of imports from Central America and the West Indies, 90 per cent of the imports from Africa, 97 per cent of those from Oceania, and 70 per cent of those from Asia now enter our ports without payment of duty.

The Underwood-Simmons bill, it is true, empowers the President to negotiate reciprocal trade agreements, but where we have nothing to give we cannot hope to secure any advantages from others. The present return from customs revenues, moreover, is inadequate. To meet increased expenses of Government, it is now proposed to increase the duty on certain articles and to impose a duty on others now entering duty free. Our present schedules, together with such changes as may be made in the near future, therefore, must be regarded as a minimum rather than a maximum tariff. Where increased duties are advocated, it is impossible to contemplate reductions from present rates which the negotiation of reciprocity treaties would entail.

Revenue vs. Foreign Trade

The present agitation for increased duties is apparently being considered without reference to the effect which the alteration of our present schedules may have upon our export trade. It has been suggested that a duty be placed upon coffee. This would greatly increase our revenues. What effect would it have on our exports to Brazil, from which country we derive our principal coffee supply? By virtue of a Brazilian executive act we now enjoy a 20 per cent ad valorem preference on 16 articles. We have a 30 per cent preference on flour, which enables us successfully to compete in the northern part of Brazil with Argentine flour, which would otherwise hold a monopoly in the Brazilian market. Brazilian sugar exporters, however, desire to secure the Argentine trade. They advocate the free listing of all flour [nullifying the American preference], in return for an Argentine preference for Brazilian sugar. The imposition of a duty on coffee might—undoubtedly would—lose for our exporters their present preference in Brazil. If such a duty were imposed, however, and rescinded as far as Brazilian coffee was concerned, not only would the breakfast table be free from a burden, but in return Brazil might grant additional concessions to American products. Such an arrangement, moreover, would be reciprocal and permanent rather than resting as it does to-day on the voluntary concession of the Brazilian executive.

Aside from the arrangements with Brazil above referred to, we have a reciprocity treaty with Cuba. It was recently imperiled by legislation free listing sugar, subsequently revoked. Our tariff as it stands to-day, however, is barren of trading margin. The general revenue bill, adopted at the last session of Congress, imposes certain duties upon the importation of aniline products, with a view to protect the aniline dye industry in this country. It also provided for retaliation in case of imposition of export duties by any country, dependency, province or subdivision of government upon print paper, wood pulp, or wood for use in the manufacture of wood pulp.

Tariff Commission

The general revenue bill of 1916 created a commission to be known as the United States Tariff Commission. This body, while it may furnish the expert knowledge which would be required as the basis for utilizing a bargaining tariff, if one were adopted, has no power to alter the present schedules. This requires Congressional action.

As matters now stand, there is about to be created a body that will study and report upon tariff conditions. There is the authority for the negotiation of what are in effect reciprocity treaties, but no means whereby reciprocal arrangements may be quickly concluded, or trading margin to provide for the concessions upon which they would necessarily be based. It is apparently imperative that additional revenue be secured from the tariff or from other sources.

Since action must be immediate, it is to be hoped that it will be intelligently designed, not only to meet

our immediate financial requirements but to serve a broader and more constructive purpose in the maintenance and protection of our foreign trade.

Most Favored Nation Treatment

The present situation would seem to be sufficiently defined to warrant a concrete suggestion based on the facts set forth herein and upon what seem to be the inevitable tariff developments in Europe. Prior to the war, the commercial relations of the great trading nations, though differing in detail, were generally based upon the "most favored nation" principle. The United Kingdom was the great free market with which all nations desired to trade.

The British interpretation of "most favored nation" treatment, under which a concession granted to one nation was *ipso facto* granted to all having "most favored nation" rights, was generally accepted except by the United States. The American Government has al-

Total value of imports from all countries during year 1915	\$1,648,386,280
Free of duty	1,032,863,558
Dutiable	615,522,722
Percentage free	62.66%

	Principal Dutiable Articles Imported in 1915		
	Total Value	Amount Collected	Average Ad Valorem Duty
Sugar	\$155,204,278	\$49,282,113	31.75%
Tobacco and manufactures of	29,499,102	24,875,246	84.33%
Manufactures of cotton	46,615,765	19,946,728	42.79%
Spirits, wines, malt liquors and other beverages	24,051,535	11,262,067	46.82%
Fibers, vegetables, etc., and manufactures of	30,399,817	9,919,213	32.63%
Iron and steel, manufactures of	15,153,890	3,392,414	22.39%

Principal Duty Free Articles Imported in 1915		
Coffee	\$106,690,848	
Hides and skins	104,188,187	
India rubber, gutta percha and substitutes	87,122,031	
Silk and manufactures of	83,401,815	
Fibers and manufactures of	69,889,492	
Wool, etc.	67,511,316	
Wood and manufactures of	56,230,597	
Chemicals, drugs and dyes	49,364,999	
Copper and manufactures of	31,477,949	

ways contended that, despite "favored nation" agreements, special reciprocal concessions imposed no obligation to extend their application to nations not granted similar advantages. Despite this conflict of practice, the United States in effect has enjoyed "most favored nation" treatment from other great trading nations. These arrangements will inevitably be affected by the rupture of the inter-European agreements upon which our "most favored nation" treatment was secured. The present indications are that Europe may abandon its former practice and adopt the American theory of reciprocal concessions. The United States, therefore, will be forced either to enter into preferential or reciprocity arrangements, or to threaten retaliation in case minimum rates are not extended to our products. By virtue of our ante-bellum arrangements, however, our after-the-war problem will not be to secure fresh concessions either from the nations of Europe or from neutral countries. It will be rather as far as possible to assure the reaffirmation of the old relationships with us, under the new systems which European nations may inaugurate among themselves. The American task will be to protect our exports from discrimination under preferential tariffs which may be adopted by the belligerent groups and under reciprocity arrangements which these groups may endeavor to negotiate with neutral nations. Such arrangements may deny to us "favored nation" treatment. This we can secure only by our ability to offer some concession or to threaten retaliation in case our products are discriminated against. To meet such a situation our Government must be able not only to act effectively but to act quickly.

This requires the creation of adequate and flexible tariff machinery. Congressional action is necessary, but Congress, while it must determine the policy to be followed, is by its very organization slow to move. Senators and Representatives have a multiplicity of duties, and even the members of the Ways and Means Committee cannot give the constant and consecutive atten-

tion to the mere machinery of the tariff, which adequate preparation for the future would seem to require. If Congress, therefore, would adopt its policy and fix certain definite limits within which the Executive should be empowered to act, the difficulties inherent in the situation might be overcome.

Conclusion

To secure the desired result, two lines of action are open. Either the general schedules should be increased, in order that concessions thereunder may be offered, or the present schedules, with such changes as may now be made, should serve as a minimum tariff, and provision be made for a graded increase on certain articles to be selected with a view to the balancing of our export and our import trade. The former alternative is manifestly impracticable. Congress, and the country at large, would be reluctant to increase all duties and remove numerous articles from the free list merely with a view to later granting concessions thereunder. The possibility of concessions under reciprocity arrangements is calculated to create uncertainty in the minds of business men. The second plan, therefore, seems the

most feasible. The precedent for such legislation has already been established under previous revenue bills. The suggested Senate amendment to the Underwood bill, with certain amplifications, vesting in the President the power to impose a surtax on certain selected articles, or a duty on certain articles ordinarily on the free list, would give both the power to prevent discrimination by the threat of retaliation and the possibility for quick and effective action.

The adoption of such legislation, the creation of the Tariff Commission, the co-ordination of the work of this commission with the departments of State, Treasury and Commerce, would give us the machinery which is required. If the principle of a bargaining tariff is a sound one, the necessity for the adoption of this principle is immediate. We do not know what the outcome of the European war may be, nor what its effects may be upon the tariff systems of Europe. We do know that these systems will be radically altered and that duties will be largely increased. Our difficulties are in any case sufficiently great. It is folly not to adopt measures which are so obviously calculated to protect our interests.

Co-operation in Trade After the War*

An Industrial Leader's Views on European Reconstruction, American Export Trade and the International Commercial Spirit

BY JAMES A. FARRELL

For the calendar year 1913 the domestic exports of the United States amounted to \$2,448,000,000; for 1916 they have apparently exceeded \$5,480,000,000. In two years of European war this country has received for its exports \$4,000,000,000 more than it would have received had the average of preceding normal years been maintained. The result has been that the United States has exchanged the status of a debtor for that of a creditor nation; that it possesses one-third of the world's gold, that its loans to other nations total over \$2,000,000,000.

European Industrial Conditions

When the period of hectic industrial activity, of inflated prices and payrolls of unheard-of amount comes to an end with the conclusion of peace, we shall have to reckon with conditions in Europe imperatively demanding the speedy resumption there of a foreign trade which experience has shown to be inseparable from domestic prosperity. Though hampered by the tragical reduction of man-power, the advent of women into the ranks of the workers in machine shops, the gain in efficiency from the wider and freer use of automatic tools, and the intensive co-operation both in production and distribution which will be universal, instead of partial in its application—all these will go far to reinforce the reduced vigor of European competition in the markets of the world.

With us entry into foreign trade is no longer a matter of choice. The distinction between domestic and foreign commerce is rapidly disappearing. No enterprise large enough to be called national can be clipped short at the boundaries of the republic. When, in the first week of the war, the almost complete suspension of our export and import trade dislocated all the activities of the home market, the American people had an object lesson which they are not likely to forget, showing that foreign trade

is a vital element in domestic prosperity. The problems that will come with the economic reconstruction of the countries now at war are bound to bring into bold relief the interdependence of nations. Our country will find the path of duty and opportunity coincide in helping to make that fact clear. Accepting the sound principle that commerce which will stand the test of time must rest on a fair exchange of values, our rightful share of the world's trade will be that to which our natural resources, developed by our enterprise and skill, entitle us.

There will be a period of industrial reconstruction for Europe, and the retarded development of neutral countries is likely to resume at least its former rate of progress. In this latter field there is room enough for all—the more so because in countries still bare of the appliances of modern civilization the process of equipment is apt to be a cumulative one. The new facilities of transportation, production, or public convenience not only create a demand for more, but help to create the wealth needed to pay for them.

It is significant that many of the orders for munitions now placed in this country provide that, should their fulfillment be interrupted by the close of the war, delivery will be taken of an equivalent amount of material for peaceful purposes. Thus, as the war demand abates, our mines, forests and workshops will be drawn upon to aid in the reconstruction of great devastated areas and the re-equipment of ruined industrial plants. All this will mean new drafts on our surplus capital, but it will also mean prosperity to our productive industry, and will thus provide a profitable return on the capital it employed. A distinction used to be drawn between government loans yielding annual interest and industrial loans usually carrying a preference for the purchase of the goods of the lending nation. But under the stress of war European governments have become the largest importers of all history. Then there are governments like those of Latin-America and China, which are so directly identified with

*From an address before the fourth National Foreign Trade Convention at Pittsburgh, Jan. 26, 1917.

works of public improvement and national development requiring the importation of materials and machinery, that their borrowings become, strictly speaking, industrial.

Europe's Reconstruction

It is difficult to realize the colossal scale on which Europe will have to borrow to make good the destruction of war. At least five billion dollars' worth of property will have to be replaced, and the demands of the work of reconstruction will be too vast to be met by private enterprise. The first demand will naturally be for houses to shelter the homeless thousands whose native villages have been reduced to shapeless ruin. The next will be for the surplus of such material, machinery and equipment as can be used to fabricate other machinery and equipment needed for industrial reconstruction and the introduction, where possible, of mechanical appliances to perform work which used to be done by hand. The process will not essentially differ from that pursued in the case of a factory destroyed by fire, whose owners, after rebuilding, first install the equipment needed to resume its most profitable production.

Co-operation Demanded

In the presence of the gigantic needs of the war-swept territories in Europe and of their poverty-stricken populations, any application of the old-time methods of competition sounds trivial.

Co-operation on the broadest and most generous scale, and in the most sympathetic spirit, must be the rule, if economic recovery is to be quick and thorough. We shall greatly facilitate international co-operation for the general welfare of the world by establishing a co-operative system of selling in foreign trade among ourselves. We shall greatly lessen the possibility of perpetuating in the domain of commerce the bitterness and hatred engendered by the war, if we refuse to be drawn into any convention, agreement or understanding that would make us parties to a boycott of the commerce of any of the nations now arrayed against each other. To meet any attempted discrimination against the exports of the United States, we shall be free to choose our own weapons and to invoke the aid of our own Government. But the American people will be prompt to recognize the fact that the poverty of Europe cannot contribute to their welfare, any more than the misfortunes of their commercial and industrial rivals can promote the prosperity of their foreign trade. I see no reason to doubt that they will prepare to do their part in laying the foundations of a permanent peace on the firm basis of mutual respect and even-handed impartiality and fairness in the dealings of commerce.

What the Export Conventions Stand For

This convention has resumed the practical discussion of foreign trade promotion, after taking into consideration international developments since the third national foreign trade convention at New Orleans last January. This convention, like its predecessors, favored the legislative action necessary to build up an American merchant marine, and specifically approved of the creation of a Government shipping board; it gave expression to the conviction that national welfare depends upon the participation in foreign trade of a steadily increasing number of smaller manufacturers and merchants, all gaining a wider market as a protection against recurring periods of domestic depression and assuring greater stability of labor employment; it protested against the application of the anti-trust laws of the United States to combinations of American exporters formed for the purpose of meeting combination

among their foreign competitors; it recognized the need of a more elastic tariff system, for the purpose of countering preferential tariff agreements that the European allies in the war may deem essential to form after the conclusion of peace, and it counseled the investment of American capital abroad in such manner as to assist the development of foreign markets and stimulate an enlarged demand for American products.

Since the last convention, two new official agencies have been created for the furtherance of a national foreign trade policy—the United States Shipping Board and the Tariff Commission. With the limitations which surround the action of both, it would be too much to expect any remarkable results from their work. But, composed as they are of men of experience, tact and discrimination, there is every reason to assume that they can render valuable service to the common cause. That cause is being also served with ability by the Department of Commerce, the Federal Reserve Board and the Federal Trade Commission. All of these boards and commissions owe their being to legislation passed in response to the demand of business organizations that the executive and legislative departments of the Government should be more responsive to the needs of commerce and industry.

While they are largely composed of business men, they must look to organizations like the National Foreign Trade Council, and an assemblage like that now before me, for an interpretation of how the Government may most effectively aid and further the business enterprise of its citizens. Whatever the recommendations you may see fit to make toward this end, I believe you may rest assured that they will receive at least respectful consideration.

Against Commercial War

But I cannot help thinking that, above and beyond the bearing of our domestic policy on the outlook for our foreign trade, we must set ourselves to grasp the larger and more vital principles of international co-operation. It is a debatable question whether the United States can become a member of an International League of Peace for the prevention of further war, but it is not at all doubtful that we can render an invaluable service to the establishment of lasting concord among the peoples of the earth by setting our face against anything that looks to the perpetuation of commercial war in peace.

The spirit in which our merchants, manufacturers and bankers addressed themselves to the relief of the sufferers by the historic disasters at Chicago, Baltimore and San Francisco, is the spirit of generous accommodation in which we must approach the needs of Europe after the war. Wealth has been lavished on the annihilation of wealth; the savings of one generation have been used to impoverish another. But from the whole ghastly conflict will emerge a regenerated Europe—a Europe with nobler ideals and higher standards of attainment, both in spiritual and material things.

In cold, prosaic fact, however, it will be a Europe needing a larger allowance of credit and presumably worthy of it. It may be regarded as certain that our share of the commerce of reconstruction must largely depend on the amount of credit we are willing to grant.

At present, our most pressing problem is how to produce quickly enough to satisfy the demands of export trade. After the war, the financial aspect of the task will come into the foreground, and the huge requirements of the necessary loans and credits will provide a new chapter in our national experience.

Greatest of Foreign Trade Conventions

Remarkable Outpouring at Pittsburgh of Business Men from All Sections to Further the Extension of Exports

The foreign trade convention at Pittsburgh, Jan. 25, 26 and 27, represented the high-water mark in the activities of the National Foreign Trade Council. The meeting at Washington in 1914 resulted in an organization of the business men of the country for the agitation of foreign trade extension. In January, 1915, at St. Louis, the movement began to take shape. At New Orleans, in January, last year, some phases of the work of the council that had been more or less in the fog came out into clearer light. At Pittsburgh, last week, with over 1100 delegates in attendance, whereas only 750 had been expected, there was a most impressive demonstration of the hold the export trade and its furtherance have taken upon all sections of the country and all departments of industry and commerce.

The question was even raised at Pittsburgh whether the movement had not grown popular too fast, the size of the convention making it, in fact, unwieldy. No resolutions are passed at these conventions. Their whole purpose is to give information, stimulate action and crystallize opinion as to the best policy to be followed by the Government, by trade organizations and by individual corporations and firms.

Each of the four conventions has revolved about an American merchant marine as indispensable to the permanent enlargement of the country's foreign trade. The thought most strongly driven home by the sessions at Pittsburgh last week was that the amount of talk the country has had in the past two years about foreign trade is far out of proportion to any realized or expected practical outcome, as long as the country's shipping problem is allowed to remain in the present do-nothing state.

How smaller manufacturers may co-operate in furthering export trade was more discussed, perhaps, than any other question. The training of men for foreign trade was also given much attention. Government foreign trade advisers were present to answer questions, and many men of importance in the export field, who had years of experience, volunteered to answer the questions of scores of manufacturers who want to extend their trade abroad.

The convention hall at the William Penn Hotel, holding 1000 people, was crowded at some of the sessions, and well filled at all. The attendance was the most representative of the country's manufacturing, trading, banking and shipping interests that has yet been seen. California sent 100 delegates, who made a bid for next year's convention. The addressees were of a high order. What stood out at all the meetings was the power that has developed among American business men in effective speaking and in intelligent, forceful discussion of great business issues.

World Trade After the War—The Tariff

The opening session of Thursday morning, like that at New Orleans one year ago, had as its main topic "World Trade Conditions After the War," the question that more than any other has been thought about and written about by American business men and economists in the past year. Some differences from the treatment it had at New Orleans are to be noted. Alba B. Johnson, president Baldwin Locomotive Works, took a very gloomy view of industrial prospects for the United States after the war, in a carefully prepared address at New Orleans. This year the alarmist view was not so prevalent; in fact, that note was little sounded. The text of the Thursday morning discussion was furnished by a 42-page report presenting a research of the Foreign Trade Council into the destruction the war has wrought in Europe and the probable requirements for rebuilding. The conclusions of this report are thus stated:

Some Economic Results of War

Co-operation replacing individual endeavor may be the general industrial result of the war in Europe. To shorten the period of reconstruction the following policies have been proposed or discussed:

1. Rebuilding the destroyed buildings and factories with governmental aid in money and materials.

2. Supply of necessary machinery and raw materials for industry by governments.
3. Allocation of labor through governmental employment agencies.
4. Monetary assistance to manufacturers and artisans.
5. Distribution of seeds, animals, and machinery to farmers.
6. Restriction of imports to necessity and control of shipping in conformity with such policy.

In some cases governmental aid may be replaced by municipal assistance.

To carry out this program governments will have to make reconstruction loans. Parts of these loans will be placed abroad where they can be used in payment for supplies to be bought from the lending country. This will prevent further declines of the exchanges without necessitating the transshipment of large gold payments.

CO-OPERATIVE BUYING

To secure best results for the money expended buying of building and raw materials will be done on a national co-operative basis. This will entail a continuance of the practice of having foreign buying agencies as now introduced by the nations at war in the neutral markets. All imports of Germany will be done under governmental control.

To rectify their foreign exchanges and to secure

an income for their industries independent from the home market European nations have announced their intention further to support the foreign trade of these industries by a program especially suited to that purpose. This program includes:

1. The granting of special rebates in buying raw materials and for transportation.
2. Co-operative exporting by groups of manufacturers.
3. Special financial assistance to exporters.

In England a bank for the extension of foreign trade has been formed. Also the government has indicated its willingness to support the creation of new industrial enterprises by special financial grants. In France preparations are made to make more general the use of motor power in medium and small industries by a better utilization of the hydro electric power of the country. In Germany the introduction of an electrical power monopoly has been discussed with the same object in view.

Steps so far taken indicate the following tendencies:

1. Exclusion of as much as possible of the profit of the foreign exporter.
2. Elimination of the necessity of buying raw materials and partly manufactured articles abroad, especially from now enemy countries.
3. Replacement where possible of manual labor by mechanical energy and a larger employment of machinery.

By carrying out this program the European nations hope to counteract at least partly the destructive influence of the war on their labor resources and to lower their cost of manufacturing so far that they will remain competitive even under the unfavorable economic conditions created by the war.

PUBLIC POLICY

The extent to which various governments will attempt to aid their foreign trade by tariff, shipping and other preferences through policies of economic alliance can only be conjectured until the war ends. The present facts have here been presented for the reader's own judgment.

Whether or not the industrial competing power of Europe will be such as to flood the United States with manufactures is beyond the province of this report and will depend upon relative wage scales, labor supply, the availability of raw material, etc.

Conditions in neutral markets will depend upon, first, capital investment by Europe and the United States and, second, the world market for products of neutral countries.

The condition of world shipping being covered in a paper to be presented at the session of the convention devoted to the merchant marine, it need no further be mentioned here than to observe that with war losses the merchant tonnage of the war will be materially less when peace comes than it was before the war in 1914.

The net result of this inquiry is the conclusion that the war which has crippled Europe's industry by vast loss of life and treasure has stimulated industrial efficiency at a moment when the world is more rapidly than ever before devising new mechanical processes for tasks formerly done by hand, while policies of governmental encouragement of business enterprise deemed impossible before the war are now the order of the day. Whatever Europe may lack in competing power it will want no resource of policy to foster its welfare in world trade.

Industrial Reconstruction in Europe

An interesting feature of the first session of the convention was a paper on "Industrial Reconstruction in Europe," presented by W. W. Nichols, Allis-Chalmers Mfg. Company, New York, who was chairman of the commission sent to France in the fall of

1916 under the auspices of the American Manufacturers' Export Association. Mr. Nichols emphasized primarily that American participation in the reconstruction of France be approached in a spirit of good-will and reciprocity. At the conferences the commission had in France the questions of credit, tariff and other trade requirements came up constantly. France is willing, not to be exploited, not to be furnished American products for one consideration—French gold—but to join with the United States in developing the resources of the two countries "by a happy joint action." Mr. Nichols said further:

When we reflect that France has today in her possession over 750 towns in the war zone demolished wholly, or in part, with a greater loss otherwise than this implies, and that more than three times that number of towns besides four of her cities of over 100,000 population each are still held by the Central Powers, we may comprehend somewhat the magnitude of her problem of rehabilitation, not of buildings and their contents, relatively a small matter, but the difficult reorganization of working forces, methods and all that which composes and sustains industrial life. The commission to France in its report publishes a list of industries, furnished in detail by the National Commission for the resumption of activities in the invaded district. This list includes under textiles, twenty-five different industries; under agricultural, eleven; under mines, metallurgical, mechanical and electrical construction, thirty-eight; and miscellaneous, twenty-five industries. This concerns what before the war engaged the activities of probably 1,500,000 workmen producing perhaps \$2,000,000,000 of product.

Furthermore, it should be noted that reconstruction in France is not by any means confined to the invaded districts; in fact, it is a fair question whether the greater task is not elsewhere.

Plans have been made which contemplate the early development of water power, according to official estimates amounting to approximately 750,000 hp., with 3,000,000 hp. more in prospect; a development, because largely for manufacturing purposes, which may afford immense opportunities for almost every product of American industry.

MACHINERY TO REPLACE MEN

France looks to us as the superior exploiter of labor-saving machinery to help her to deal with what she expects to be the most difficult phase of her reconstruction, namely, to find adequate means to offset a great deficiency in her former manual labor. She estimates this deficiency will actually be 1,500,000 men, and to this must be added serious impairment of effective personal service by the loss of limb, sight or other sense. Her dependence upon female substitutes, now saving the nation, can obviously be only a temporary expedient which as long as it lasts will restrict national progress in vitally important respects. In fact, France is so impressed with the gravity of this situation that at the outset this constituted the principal reason given for our commission's visit.

What the requirements in this particular will be no estimate at this time can foretell, for the needs of replacements alone can only be rudely guessed. It is estimated, however, that in the replacement of textile machinery alone between \$75,000,000 and \$100,000,000 will have to be expended. It is figured that \$600,000,000 will be required for the replacement of industrial property in the French war zone alone—that the results of any calculation constitute a commentary on a condition so unprecedented in history as to occasion bewilderment. When in addition to this, one considers the serious deterioration of machinery everywhere, due to an extraordinary tax on production and a tax frequently met by unskilled operatives, rehabilitation generally means something so enormous as to vitiate any theory that may be advanced. No one can know anything about it.

Machine tools and textile machinery of every type are not by any means the only requisite, for by an

easier calculation there is made known in agriculture an imperative need for 17,200 farm tractors, 125,000 plows, 10,000 threshers, a large number of harrows, cultivators and other implements; urgent requirements that cannot possibly be produced by France alone.

It is very evident that to furnish France and Belgium what will enable them to resume their former industrial activities will test available resources for several years to come; to meet depletions in practically every direction of national life that we saw ourselves will tax to the utmost and for a long time all the cleverness for which the French are noted. Former normal conditions of life have been so wrenched and distorted that all Europe after the war will have to adjust itself to altogether new conditions. There are many reasons why dumping low cost products into our market appears not only improbable, but impossible, for many years to come.

Willard Straight, vice-president American International Corporation, New York, presented "The Foreign Trade Aspect of the Tariff" in a thoughtful address from which liberal extracts are given in another column.

Estimates of Europe's Loss

The Foreign Trade Council's analysis of "World Trade Conditions After the War," presented to the convention in the form of a voluminous pamphlet, put out the estimate that the destruction of public and private property was \$3,735,000,000 in the western and \$2,250,000,000 in the eastern theater of war. This does not include the destruction of shipping. The report says:

The destruction of private dwellings is large where fighting has taken place, but much is left that can be used in rebuilding. Foundations, in many cases, have remained intact. The roads had been frequently destroyed by retiring troops and seriously damaged by gunfire and excessive use. In many cases the foundations may be found useless and require entire renewal. Road repair will form a heavy item in budgets of smaller villages.

The destruction of bridges can be regarded as complete in every fighting zone. Railroad tracks have been partly destroyed, but much has been repaired for the use of the army and civil population.

The greatest enemy of industrial property has not been military operation, but enforced idleness of machinery and buildings. The furnaces of the big iron companies were damaged by gunfire in several cases. The destruction of stocks of raw materials was extensive, not only to prevent their falling into the hands of invading armies, but through bombardments. Germany has removed part of the machinery and equipment of certain Belgian plants to Germany to obtain certain raw materials like copper or to furnish German plants with additional machinery.

The immediate needs of the two countries during the first year after the war may be as follows: Agricultural buildings, Belgium, \$50,000,000; France, \$50,000,000. Agricultural machinery, for Belgium, \$50,000,000; France, \$50,000,000. Industrial buildings, for Belgium, \$65,000,000; France \$50,000,000. Mining machinery, for Belgium, \$60,000,000; France, \$40,000,000. Iron industry machinery, for Belgium, \$70,000,000; France, \$50,000,000. Food making machines, for Belgium, \$3,000,000; France, \$10,000,000. Chemical machinery, for Belgium, \$6,000,000; France, \$6,000,000. Textile machinery, for Belgium, \$65,000,000; France, \$50,000,000. Electrical machinery and equipment, for Belgium, \$130,000,000; France, \$50,000,000. Wood working machinery, for Belgium, \$20,000,000; France, \$18,000,000. Paper making machinery, for Belgium, \$5,000,000; France, \$3,000,000.

That Germany cannot resume her export trade until the raw materials have been imported for domestic needs is another probability to which the report gives attention, with a comment that Germany will restrict importations at first to essential articles. The destruction of property in Poland is estimated at \$875,000,000, that in Austria at about \$600,000,000, and in the Balkans, \$300,000,000. The proposed economic alliances among the Allies of both groups of belligerents, the economic grouping of the Scandinavian countries and the Russo-Japanese alliance are also discussed in the Council's report.

National Shipping Policy

As at New Orleans last year, the session devoted to the American merchant marine developed more interest and enthusiasm than any other. As at New Orleans, also, Capt. Robert Dollar, the veteran San Francisco ship owner, was a central figure. Captain Dollar's white hair and beard and his weatherbeaten face are striking, and his straightforward putting of things, with his inimitable spice of wit, united to complete the capture of his auditors. He presented the report of the committee of the National Foreign Trade Council on "World Shipping Conditions and the American Merchant Marine." Some of the statistics in this report are noteworthy. The merchant shipping of the world was put at 85 or 90 per cent to-day of what it was when the war broke out, and it is estimated that only slightly more than 50 per cent of the whole mercantile fleet of the world is now available for peaceful trade. British yards in 1913 turned out about 1,975,000 tons of shipping. Last year their output was reduced to 580,000 tons. In the United States last year, including vessels built on foreign account, 560,000 tons was launched. On Dec. 1, 1916, steel ships ordered from American yards stood on the books at 1,428,000 tons, and in the United Kingdom 1,800,000 tons was then in various stages of completion.

Ten Times \$50,000,000 Needed

In connection with the appropriation by the Government of \$50,000,000 for acquiring vessels,

the report says that a great problem will be the judicious expenditure of so much public money without the risk of a great depreciation of initial investment when conditions have returned to normal. The report says that between 6,000,000 and 10,000,000 tons of ships will be needed to realize the expectation that American merchant marine will carry from 50 to 60 per cent of our total foreign trade. The investment that would be represented in such a fleet is probably ten times the \$50,000,000 appropriated by the ship purchase act.

"Therefore, the duty which lies before the Shipping Board created by the same law is not so much the expenditure of that appropriation under the dangerous conditions existing at present, but the evolution of a policy enabling American ships to compete on equal terms with those that have in the past carried the preponderating share of our foreign commerce."

It was pointed out that under normal conditions of peace it cannot be expected that private companies will undertake the operation of Government ships unless the rate of lease or charter is sufficiently lower than the market to offset higher American operating costs. In this connection Captain Dollar interjected this: "Ship owners don't want any subsidy, but if a Japanese owner, for example, pays sailors only \$20 a month and the American sailor is getting \$50, let the Government pay the \$30. That wouldn't be a subsidy, but just a little help to the poor sailor." Captain Dollar gave

the significant figures as to the percentage of vessel tonnage on the Pacific coast operated by different countries before the war and now. American, 26.10 per cent, now (after the La Follette bill), 1.97 per cent; British, 29.38 per cent, now 37.09 per cent; German, 18.47 per cent, now 0; Japanese 26.05 per cent, in May last 50.90 per cent.

The old Pacific Mail Company paid no dividends in 13 years. "How would you like it?" said the captain, amid laughter—"13 years between drinks." In conclusion the report of the committee, on which James A. Farrell and P. A. S. Franklin were associated with Captain Dollar, said this:

The Merchant Marine Committee of the National Foreign Trade Council is conducting a continuing work of investigation, the results of which from time to time are made public. Pending the organization of the Shipping Board and an indication of its interpretation of the shipping act and the policy it proposes to pursue, the committee at this time deems it inadvisable to make further recommendation than that all business interests co-operate to the best of their ability with the shipping board, and that the board itself lay the foundation for a policy which will encourage the private endeavor which alone can produce, and permanently maintain, a fleet adequate for the carriage of a greater share of our own and the world's commerce.

President Powell on Shipyard Handicaps

J. W. Powell, president Fore River Shipbuilding Company, Quincy, Mass., discussed in an able paper the present condition and the prospects of American shipbuilding. He traced the history of shipbuilding and the status of the merchant marine in the United States, coming down to the last effort toward a revival of the merchant marine in the appointment of the Federal Shipping Board. While there is not the experience in shipping on that board that could be desired, it is to be hoped that time may bring improvement. The speaker estimated that if the war ended to-day the world's shipping available for commerce would stand at 40,000,000 tons. In the United States the average tonnage turned out over a period of years, including that on the Lakes, was 250,000. This year the United States would probably produce about 1,000,000 tons, which would be its high record. More than 25 per cent of the ships now building are for foreign owners.

PROSPERITY FOR A TIME

For three years after the close of the war the shipyards of the world will not be able to meet the demand upon them. As a net loss of 10,000,000 tons in the world must be made up, the next five years should show full activity in shipbuilding. In the United States there is a great scarcity of skilled

mechanics who follow shipbuilding. Of the labor now so employed 60 per cent was not engaged in that work a year ago. In the scramble for labor the new yards have taken men from the old.

Touching on the complaint of the Navy Department against the shipbuilding companies, the speaker said that three great yards on the Atlantic coast had given up 70 per cent of their capacity to Government work in the midst of a demand from all the world which was of the most profitable character. Of the preparations for extending the capacity of the Government yards so as to build more war vessels, Mr. Powell said that the ultimate outcome would be the entering of the navy yards upon the construction of merchant vessels. Nothing worse could happen to the shipbuilding industry than for the Government thus to go wholesale into the building of merchant vessels. The real test of the position of our shipbuilding industry will come after five years. There has been a great decrease in the efficiency of labor. In foreign yards labor cost is 50 per cent less and efficiency of workmen averages 14 per cent more. Cost of operation is 40 per cent more under American laws. The shipbuilding industry, like the steel industry, has an alternation of ups and down, and neither for ship-builders nor ship owners is the outlook for the farther future at all attractive.

More Tonnage in Latin-American Trade

A. Eugene Bolles, manager of the Spanish edition of *World's Work*, presented a paper on shipping to Latin America, giving the results of a survey of the increased shipping facilities between the United States and South America. Between 1914 and 1916, he said, the total clearings from United States to South America represented by American vessels increased 433 per cent, while foreign tonnage in the same trade remained stationary. Ship space available for carrying from the United States to South America increased 50 per cent in 1916 over 1914. The addition of half a million tons already planned and the number of vessels driven from European trade by the dangers of the war will tend to the lowering of rates to South America. Further help will come after the war from the releasing of one-third of the world's tonnage for use in peaceful commerce.

Bernard N. Baker, of the Federal Shipping Board, was on the program for an address on the work of that board, but did not come to the convention. His absence is apparently explained by the sending in of his resignation to President Wilson because of the Administration's desire to dictate the selection of chairman of that board.

Co-operation in Foreign Trade

Stress was laid, in considering co-operation in the foreign trade, both on co-operation among exporters at home and on co-operation with foreign countries to the extent in many cases of financing their needs. Lewis E. Pierson, chairman Irving National Bank, New York, and C. K. MacIntosh, vice-president National Bank of California, San Francisco, brought out strongly the necessity for an enlarged participation by American banks in the financing of foreign improvements.

Festus J. Wade, president Mercantile Trust Company, St. Louis, urged upon the convention the differentiation between the external loans which the United States is making from time to time and the internal loans which the warring nations are negotiating with their own people. These internal

and external loans amount to about \$75,000,000,000, yet it is to be remembered that the external debt negotiated here by the warring countries is less than $\frac{3}{4}$ of 1 per cent of the total. With much earnestness Mr. Wade contended that the banking interests of the United States must not fear for the faithfulness of the countries of Europe in meeting their obligations to American holders of their securities. He predicted that every dollar of such indebtedness would be paid and on the strength of these loans and those yet to be made the United States would build up most satisfactory trade relations.

Secretary Robert H. Patchin presented the re-

(Continued on page 348)

ESTABLISHED 1855

THE IRON AGE

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Class and Sectional Taxation

The revenue bill now before the House at Washington is the full flower of the vicious practice, rapidly coming to be common, of taxing a portion of the community and letting the rest of it go scot free. It illustrates how easily the taxing machinery, once well started, can be made to increase its yield. The income tax at 1 per cent was only a way of getting at the possibilities of such a levy. Once the small percentage of the population subject to such a tax was located, it required only a turn of a screw to double the output. And from 2 per cent the advance to 3 per cent can be made with equal facility.

Similarly with the corporation tax. Once the list is made up and the status of every industrial and commercial company is known to the government, the temptation to get twice as much revenue with the same outlay for collection is irresistible.

It is hard to imagine to what extremity the revenue raisers in Congress would have been driven to provide for the results of gross blundering had not the war come to the rescue. And now preparation to meet very moderate requirements of national defense is made justification for taxation discriminating in a glaring way both as to classes and sections.

Industry and trade are singled out for the excess profit tax, while agriculture, which has counted profits under the war demand of the past two years that are almost beyond precedent, is left practically untouched. It is scarcely more than two years since many industrial companies were writing their balances in red. Now that they are beginning to recoup, their earnings are levied on to an extent never before known either in war or in peace. Preparedness is not a matter of a part of the people or a part of the country. In the November election there was an overwhelming decision for it, regardless of party lines. Now the amazing claim is made that because certain industries will be called upon to equip the country for defense, the districts which contain those industries should pay for the country's protection. The following from the *Congressional Record* of Jan. 27 is illuminating:

Mr. Kitchin: I notice the gentleman from Massachusetts (Mr. Rogers) read a statement from a New York paper—the *New York Times*—in which it is said that I said in the caucus last night that most of this tax—practically all of this tax—will come from north

of Mason and Dixon's line. I did not say that, nor anything of the kind. I never mentioned the Mason and Dixon line, nor did I mention New York City; but I will say now that this tax will go to pay appropriations practically all, or most all, of which will go north of the Mason and Dixon line. The appropriation for preparedness will go for the most part to shipyards, munition makers, and so forth. These happen to be north of the Mason and Dixon line.

Mr. Norton: Will the gentleman yield? Where does the gentleman think the tax will fall—south of Mason and Dixon's line?

Mr. Kitchin: I think most, or the greater part, will be levied north of Mason and Dixon's line. All these fellows who live in States that will pay a large part of this tax can get rid of the location argument by removing down to my town of Scotland Neck and pay the tax from there.

As the *New York Times* points out, the dozen Southern States in which the clamor for public building and river and harbor "pork" is loudest will of course be taxed heavily on rice, tobacco and cotton to pay the bills; and in the same way the \$20,000,000 for the Government nitrate plant will be raised chiefly from the Southern cities and States which expect to locate that plant within their borders.

Not long ago business, particularly big business, was a target for prosecution, often with more than a suspicion that political ends were to be served. Then it came in for fresh discipline through the lowering of tariffs and the increase of foreign competition. Now certain business pursuits and certain sections are to be made to feel the burden of heavy taxation. At the very time when there is need to develop and to intensify the national spirit, we have the monumental folly and injustice of taxation of classes and sections.

Europe's Future Machinery Demand

The great outlays of money and the elaborate organizations of corporations which have for their object solely or in part the distribution of American machine tools in Europe are abundant evidence of the belief that a great volume of business in these lines will follow the ending of the war. It is significant that those in closest touch with foreign conditions hold most strongly to this view and are backing their opinion by far-reaching and costly plans.

Forward-looking men in the machine-tool trade,

in fact all whose business principles are sound, have been giving deep thought to the future, and in so doing they have not neglected the European phase of the question. It is interesting that they find phases of prospective domestic and export business which are not dissimilar. The great demand from abroad, however, is still for equipping munitions plants, or making replacements in them, whereas in this country it is more largely the ordinary industrial demand which is now bearing on the tool builders.

What will become of machines discarded by domestic munitions plants has been the moot question of two years in the home trade. It applies even more to the vast quantity of tools which Europe has been absorbing, and on which she has been depending to fight her battles quite as much as on the men in the field.

That tools long subjected to forcing on munitions work are not a desirable acquisition to a first-class shop is generally admitted, and this is particularly true of the tools that are working in European shops. Those who have studied the situation abroad at close range point out that in the countries at war stern necessity has compelled the use of unskilled labor to a much greater extent than here. Thus the disastrous results to machinery have been even greater than here. Production has been imperative; it has meant life or death, and cost has mattered little. In England in particular a wonderful efficiency in the manufacture of shells has been attained. Machinery is never idle, and its life has been crowded into a comparatively short time. Some of the methods employed there, as here, as a regular procedure constitute actual abuse which would never be practised in times of peace. Therefore, while some of these tools may come upon the market after the war, most of them will be fit for little but the scrap pile.

The opportunity for American tools, it is therefore argued, will continue long after the cessation of the war—until Europe gets on her feet; by that time our manufacturers and distributing agencies should be well versed in foreign methods and requirements and better fitted to compete. In this connection an important factor will be the plight of Germany. Those who have had the opportunity to study this phase of the question on the ground say that Germany will not figure largely as a seller of machine tools for some years.

Present methods of doing business with foreign buyers of tools must undergo a great change. In the matter of payments time must be given, and agencies which can finance export sales will be the most successful, if not the only ones. Even with the terms of sale made satisfactory to both sides and other details agreeably arranged, the way will not be easy. It has been said often of late that the United States has few friends in Europe, and it is the fact that many orders have been placed here grudgingly, certainly not with the cheerfulness to be expected from a needy buyer who had found what he wanted. Recently one such purchaser in placing an order grimly remarked, "We'll be selling things to you pretty soon."

Reciprocal trading may do much to dissipate the existing feeling. Organizations with banking and shipping facilities, and with intimate knowledge of

the requirements of the countries with which we seek to do business, must buy as well as sell. Only on the basis of give and take can they wipe out the jealousy—it is largely that—created by this country's fortunate position and its resultant prosperity.

Stimulating Railroad Development

Reference was made in these columns one week ago to the extreme desirability of railroad development being regulated in scientific and adequate manner, so that the transportation system of the country should at all times be reasonably sufficient to the needs of the industries. It may be well to discuss more specifically how such a system of regulation, as well as stimulation, might be developed.

It seems entirely reasonable to expect that if it were guaranteed to the public that railroad growth was being produced for the benefit of the country and was under scientific, reasonable and honest control, much of the opposition to railroad rate advances would disappear. Men are becoming more intelligent, more willing to live and let live, more willing to pay for service; but they are likewise much more particular in inquiring what is going to be done with their money when it passes into the hands of the other party.

The first requisite would be to study carefully how much a given road should increase in capacity during a period of, say, five or ten years. The next requisite would be to determine, in the light of the best knowledge obtainable, how the increase in capacity should be effected, the expenditures being allotted to grade reduction, additions to track mileage, increases in rolling stock, etc. This scientific allotment would take the place of the present procedure, dictated by the fact that the management of a railroad must serve the needs of the moment, with insufficient funds, and without clear knowledge of what the future of the road will be permitted to be.

As plans were matured indicating the amount of expenditure that ought to be made, the question of how funds were to be provided would then be taken up. Action that from our present viewpoint might be considered radical would probably have to be taken; but what might be extremely radical under the present alignment might prove entirely conservative and perfectly reasonable were there absolute assurance, based upon adequate information and study, that the investment of the funds would be for the best interests of everyone. If a given road were overvalued it might be necessary to order a reduction in its dividends. If it were undervalued it would be right to authorize it to issue new securities. If the public would not buy them, it would be on account of lack of confidence in the Government body having control of railroad expansion, and in that event the Government should guarantee the new security. The body in control should be so constituted that its judgment would be conclusive, and the guarantee would then involve little if any risk on the part of the Government.

It is apparent to everyone that years of time have been lost during which the railroad system of the country has not grown as it should. Even if it were up to date the work needed for the immediate coming years would be great. It is precisely

ten years ago (Jan. 14, 1907) that the late James J. Hill made his statement that the country would need 75,000 miles of new railroad to keep up with industrial requirements, and that the 75,000 miles ought to be built within five years. The actual increase in the ten years has been 28,993 miles, 39 per cent as much in ten years as was stated to be needed in five years.

It may be that Mr. Hill was wrong. If James J. Hill was wrong the fact would furnish the strongest testimony possible that a thoroughgoing system should immediately be established to determine what the country does need. Either the wrong of the expansion not having occurred should be righted as speedily as possible, or, if the judgment of one of the greatest men in the whole history of railroading was wrong, a better system for providing transportation facilities should be provided than dependence upon the judgment of the men in control of the different railroad systems of the country.

Teaching Workmen Accident Risk

Employers of labor as a rule do not appreciate the importance of special instruction to newly hired workmen, in the effort to keep down the accident rate. In this connection a useful feature of the operation of workmen's compensation is the statistical side of the State reports, which permit an analysis of accidents in their relation to their causes. The latest Wisconsin report brings out forcibly the fact that a great number of accidents occur in the early period of men's employment and that the hazard tends to decrease as they become familiar with their labor and environment.

A study of 11,494 accidents in Wisconsin industries in their relation to length of service at the time of injury, shows that 11 per cent (over 1200) occurred in the first week of the injured men's employment, 5.5 per cent in the second week, 22 per cent in the period between two weeks and three months, 10.6 per cent in the period between three and six months, and 11.5 per cent in the period between six months and one year; the remainder, about 40 per cent, came after one year of service. The fact that first week cases of accident equaled the number among men who had worked from three to six months, and that the latter total was as great as that for the second six months of employment is of much significance. It proves that experience plays a very important part in the hazard of industry. There is really nothing astonishing in this. It is the factor of ignorance in the accident problem. When a man has learned the dangers that surround him, he cannot but be safer, unless he develops the careless habit, which is the root of a large part of the industrial peril to life and limb.

In considering the rate of injuries in the early days of employment, one important allowance must be made for the element of floating labor. It is often necessary to hire great numbers of men in a year in order to maintain a working force at a given strength. Sometimes the total number of persons whose names appear on a payroll in the course of a year is several times the average number of employees. But even so, something is wrong

when accidents crowd into the early days of employment. The responsibility cannot but rest largely upon the organization.

An Appeal to Industrial Laboratories

An appeal to industrial laboratories to contribute to scientific literature more than they do is made by the committee on engineering of the general research committee of the American Association for the Advancement of Science. The subject has been brought to the attention of THE IRON AGE by Prof. A. E. Kennelly, Massachusetts Institute of Technology, Cambridge, Mass., on behalf of his fellow members of the sub-committee, who are Prof. J. W. Richards, Lehigh University, South Bethlehem, Pa.; Prof. Albert Sauveur, Harvard University, Cambridge; Prof. A. N. Talbot, University of Illinois, Urbana, Ill., and Prof. C. C. Thomas, Johns Hopkins University, Baltimore. Prof. Kennelly writes as follows:

"In the course of work done in the numerous industrial laboratories of America, many physical and commercial constants and data of great scientific interest and value are doubtless arrived at, and which may, for a certain period of time, constitute an asset of considerable commercial value to the particular corporations in question. During this period everyone recognizes the proprietary right of the industrial laboratories to the retention of this information.

"A time frequently arrives, however, when such scientific information loses its commercial value (often by being duplicated in other laboratories), and just at this point we wish to impress upon the industries their obligation to enrich scientific literature with such facts and data which might otherwise be lost or forgotten.

"Some of our industries have been reproached with the suspicion of acting as sponges, in that they absorb an immense amount of useful information from scientific literature without giving any return in kind. This suspicion would be entirely removed if, from time to time, scientific information which has ceased to be of commercial value were contributed by them to its appropriate channel and thus became available to all scientific workers throughout the world.

"If any doubt exists as to the appropriate channel for the publication of such scientific data and communications, the secretary of the A. A. A. S., Dr. J. McKeen Cattell, Garrison-on-Hudson, N. Y., will be glad to act as intermediary and to forward such communications to the proper scientific body."

The Benzol and Toluol Markets

The benzol market is reported as very firm at 55c. to 60c. per gallon, producer's plant, for either spot or contract material. The quantity remaining unsold for contract is very limited. If any large business were to be offered, it is said that it would be necessary to draw from at least two to five producers to fill the order. It is estimated that if the two or three consumers of benzol who used large quantities last year demand as much this year, the supply will be insufficient. Contracts already entered into have absorbed nearly all of the available supply, and the spot price is expected to advance soon.

Producers of toluol have practically none to sell and any excess output will be sold as spot material. The quotation for contract toluol is \$1.50 to \$1.75 per gallon, producer's plant, with \$1.75 to \$2 per gallon asked for spot, both depending on the size of the order and other conditions.

Solvent naphtha is weak. A large amount remains unsold but more business is being done. The prices asked are 25c. per gallon on contract and 25c. to 30c. for spot material. The former could probably be shaded on desirable business.

The Nagle Steel Company, Pottstown, Pa., has placed contracts with the Bedford Foundry & Machine Company for two large traveling cranes for its Glasgow plant, one to be erected in the steel mill and the other in the yard.

THE TAX ON BUSINESS GAINS

Manufacturers and Merchants to Bear the New Burden, but Not Agriculture

WASHINGTON, Jan. 30, 1917.—The Kitchin revenue bill, framed by the Ways and Means Committee, has been approved by the caucus of the majority of the House. It will be taken up for passage by the House during the present week, and the leaders of the Senate are planning to put it through that body before adjournment on March 4.

The bill as reported to the House provides for a bond issue of \$100,000,000, increases by \$100,000,000 the one-year, 3 per cent Treasury notes authorized by existing law, raises by 50 per cent the Federal tax on inheritances, and levies a so-called excess profits tax of 8 per cent of the net gains of all business partnerships and corporations in excess of the sum of \$5,000 and 8 per cent of the actual capital invested. The net proceeds of the excess profits tax, estimated at \$220,000,000, and of the inheritance tax, estimated at \$30,000,000, and the sum of \$175,000,000 to be segregated from the receipts under the omnibus revenue act of Sept. 8, 1916, are set apart as a separate fund in the Treasury to be used only for expenditures for the support of the army and navy and for fortifications.

Individuals and Agriculture Exempt

The excess profits tax is not limited to industrial corporations, but applies to all forms of business carried on by partnerships and corporations except partnerships engaged in agriculture or in the rendering of personal services as in the case of professional men. The incomes of merchants as well as manufacturers are subject to the tax, provided the business in question is carried on as a corporation or partnership, and the proposed law creates a well-defined discrimination in favor of individual ownership inasmuch as the income of a partnership engaged in the wholesaling of steel products, for example, would be subject to the new tax, while that of an individual doing a much larger business of the same character would escape the impost. The rather vague explanation of this discrimination is made on behalf of the framers of the bill that in such a case the individual would pay a larger income tax under the act of Sept. 8, 1916, and therefore should not be subjected to the excess profits tax.

Another peculiar feature of the bill exempts from the excess profits tax the operations of individuals and partnerships engaged in agriculture, but does not exempt corporations pursuing the same industry. Lest this exemption should be criticised as an attempt to secure the farmer's vote it is stated on behalf of the committee that the authors of the bill have merely followed the "almost universal European custom of exempting agriculture from similar taxes."

"Capital" Defined

In figuring the tax on excess profits the term "capital" is specified to mean, first, actual cash paid in; second, the actual cash value at the time of payment of assets other than cash paid in, and third, paid in or earned surplus or undivided profits used or employed in the business; but does not include money or other property borrowed by the corporation or partnership. The new tax is to be computed upon the basis of the net income shown by income tax returns required by the act of Sept. 8, 1916, and is to be assessed and collected at the same time and in the same manner as the original income tax. The collection of the first tax under the proposed law will be made after March 1, 1918, and will be based upon the tax returns covering the calendar year 1917, or the fiscal year of such partnerships or corporations as are permitted under the act of Sept. 8,

1916, to make their returns on the basis of their own fiscal years.

The Kitchin bill will not be passed by the House without a hard fight. Thirteen Democratic members of the body joined in a revolt from caucus domination and refused to be bound by the resolution indorsing the bill. The Republicans will oppose the bill almost to a man and, as the Democratic majority is but 22, a combination between the Republicans and the revolting Democrats would beat the bill. There are also interesting possibilities in the Senate for the reason that two or three Senators can easily kill the measure, in view of the fact that Congress will adjourn in four weeks and the legislative docket is so crowded that it will be difficult to make any progress except by unanimous consent. While the defeat of the revenue bill would undoubtedly force an extra session, a fact that would deter the opponents of the measure from making a last-ditch fight, it is pointed out that in the new Congress, which would assemble in special session, neither the Democrats nor the Republicans will control the House, the balance of power being held by a small contingent composed of Independents, Progressives, Socialists and Prohibitionists; hence it will be extremely difficult, if not impossible, to pass a partisan revenue bill or any other strictly party measure through the new House.

W. L. C.

Heavy Rail Exports

Rail exports from the United States for the 11 months to Dec. 1, 1916, were 499,224 gross tons, exceeding the 1913 record which was 460,553 tons. In November last they were 55,022 tons with the average for September, October and November at 64,817 tons. The 1916 exports probably exceeded 550,000 tons. Of the 499,224 tons to Dec. 1 Russia took 112,219 tons; the West Indies and Bermuda, 77,842 tons; Canada, 35,577 tons, and other countries, 221,365 tons.

Imports of rails are much less than they were a year ago. For the 11 months to Dec. 1, 1916, they were only 25,777 tons against 77,245 tons to Dec. 1, 1915. For all of 1913 they were only 10,408 tons.

American Pig Iron Association's Meeting

At the annual meeting of the American Pig Iron Association held in Cleveland, Jan. 24, J. G. Butler, Jr., Youngstown, Ohio, was re-elected president; Frank B. Richards, treasurer, and John A. Penton, secretary, both of Cleveland. Only business of a routine character was transacted. A general meeting of the association will be held in New York City April 26.

Locomotive Orders

The New York Central has ordered 50 locomotives from the American Locomotive Company and may increase the order to 60. It has also ordered 45 locomotives from the Lima Locomotive Corporation. The Pennsylvania Railroad has announced its 1917 schedule of purchases, including 225 locomotives, for its lines east of Pittsburgh. Total orders for 1917 to Jan. 27 are estimated at 470 locomotives.

The 200-hp. airplane motor built by the Packard Motor Car Company was shown to the public for the first time in the Packard exhibit at the recent Detroit Automobile Show. Until a few weeks ago this engine was kept under guard in the experimental department. It is a 12-cylinder engine of the V type, with cylinders inclined at an included angle of 40 deg., to provide for minimum air resistance.

The Eastern Brass & Ingot Company, Waterbury, Conn., announces the change of its name to Eastern Brass & Ingot Corporation of New York. No change is occasioned as to the personnel of the management or the interests concerned in the business.

NAVY SHELL CONTRACTS

Work Hurried on Federal Projectile Plant— Conference on Bethlehem Proposals

WASHINGTON, Jan. 30, 1917.—The refusal of the British Government to permit Hadfields, Ltd., to proceed with work on the contract for 14 and 16 in. shells for the American Navy "so long as the exigencies of the war continue" has completely upset Secretary Daniels's plan, which not only contemplated the contract referred to, amounting to 7500 shells, but another allotment of 7800 if the British concern could be induced to accept the additional order. An immediate result of the withdrawal by the British Government of the permission which it is understood was previously granted to Hadfields, Ltd., has been the giving of peremptory orders by the Secretary of the Navy to hasten the work upon the naval projectile factory for which Congress has appropriated \$1,500,000. The incident has also served, however, to stimulate the leading American manufacturers of projectiles to every possible effort to obtain these contracts and to refute the assertions of the Secretary of the Navy that superior large caliber shells cannot be produced in the United States.

While considerable mystery surrounds the action of the British Government with regard to the Hadfields contract there is no suggestion of bad faith in Secretary Daniels's assertion that the bids of the British concern were "based on the distinct understanding that there would be no question of the right to deliver regardless of the war situation in Europe," as it is assumed at the department that the American representative of Hadfields submitted the bid in accordance with a permit granted by the British Government, which subsequently was revoked. Such arbitrary official action is characteristic in war times and while disappointing to the Navy Department has occasioned little surprise.

Conference with C. M. Schwab

Much interest attaches to the unannounced visit to Secretary Daniels of Charles M. Schwab, who spent two hours with the head of the Navy Department Jan. 27, seeking to convince the Secretary of the desire of the Bethlehem Steel Company to co-operate with the Government in meeting every possible phase of the present emergency not only with respect to shells, but also as to naval rifles and warships. Secretary Daniels declared early in the interview that in spite of the withdrawal of the Hadfields bid he would not consider any of the tenders heretofore submitted by the American manufacturers, adding that, while the department was embarrassed by the necessary change in plans, he felt confident that the Naval Ordnance Bureau had been sufficiently forehanded in taking the matter up to enable the desired shells to be manufactured in the proposed projectile factory, which, it is estimated, will be completed within twelve months. The shells were designed as reserve ammunition for the big naval rifles for the dreadnaughts and the Secretary expresses his belief that if the facilities of the new projectile factory were concentrated upon their manufacture they could be completed in less time than the American manufacturers propose to consume, although not so quickly as they would have been supplied by Hadfields, Ltd.

Private Works Still a Dependence

Secretary Daniels assured Mr. Schwab, however, that it was not the policy of the Navy Department to attempt to supply all the needs of the Navy in Government establishments. The new projectile factory, he said, would be located in conjunction with the Government armor plant, and the entire establishment would

probably be operated one shift for the purpose of turning out about one-third of the projectiles and armor required by the new Navy. The remaining two-thirds, he said, would materially exceed the total quantity of both armor and projectiles required in recent years and would be contracted for, provided the American manufacturers would submit bids which the department would regard as reasonable.

Mr. Schwab made a spirited defense of the American manufacturers both in the matter of the prices submitted for 14 and 16-in. shells and the recent bids on battle cruisers. The Bethlehem Steel Company, he said, had spent enormous sums providing facilities for the manufacture of shells and big naval rifles, and even at the prices tendered the Department could not hope to make any money. Compared with commercial work the needs of the Government were small and while this fact rendered it practically impossible for his company to make any money on naval contracts it made it possible for the company to co-operate with the Government in supplying war material at prices which could not be considered if applied to the bulk of its output. Concerning the battle cruisers, Mr. Schwab emphasized the fact that the construction of these vessels called for the installation of costly facilities of no value whatever for any other purpose, and, further, that the vessels themselves were more or less experimental, combining size and speed in a degree never attempted in this or any other navy.

The Bethlehem Situation

Some little heat was displayed by both Secretary Daniels and Mr. Schwab when the Secretary's recently published reflections upon the Bethlehem Steel Company and the reply of President Grace were referred to, the Secretary objecting to what he styles the company's "attacks upon the department," while Mr. Schwab stoutly defended President Grace's course in putting before the public the facts with regard to the contracts which the Bethlehem company has not yet fulfilled. While the interview did not result in any definite modification of the Department's plans, it is believed that other conferences will follow and that concessions on both sides will result in the placing of a large volume of the Government's business with private contractors based both on Congressional authorizations heretofore made and upon the pending Army, Navy and Fortifications appropriation bills.

The Federal Steel Plant Threat

Daily newspaper publications to the contrary notwithstanding, the Navy Department has not yet decided to urge Congress for an appropriation with which to construct a fully equipped steel works. For several months Secretary Daniels has had this matter in mind and orders were recently given for the preparation of a rough estimate of the probable cost of such an establishment. The Department has no funds, however, with which to make a detailed survey of such an enterprise which would involve the employment of a corps of engineers and accountants and would cost a large sum. It is characteristic of the present administration of the Navy Department that the threat of the Government steel works should be emphasized at a time when the Secretary is negotiating with private manufacturers concerning the cost of war material and the speed with which deliveries can be made.

W. L. C.

The Worth Steel Company has been incorporated to manufacture, sell and deal in iron, steel, manganese, etc., with a capital of \$2,500,000. The incorporators are John S. Worth, William P. Worth, Edward H. Worth, William A. Worth, and Norman L. Entrekin, all of Coatesville, Pa. The location of the plant is understood to be at Claymont, Pa., a few miles south of Chester on the Delaware River.

STEEL CORPORATION EARNINGS

Earnings 1916 Exceed 1915 by \$203,273,790, or 156 Per Cent—Surplus, 356 Per Cent More

The net earnings of the United States Steel Corporation for the last quarter of 1916 were \$105,968,347, being far in excess of any previous quarter. The total net earnings of the year were \$333,625,086, exceeding 1915 by \$203,273,790, or 156 per cent. The surplus for the year, after the payment of all dividends, was \$201,935,749, exceeding 1915 by \$157,720,032, or 356 per cent. The contrast with 1914 is much more striking. The operations of that year, even with the passing of dividends on the common stock, resulted in a deficit of \$16,965,685.

The Last Quarter's Showing

The detailed statement for the quarter ended Dec. 31, 1916, as compared with the corresponding quarter of the previous year, is as follows:

	1916	1915
October earnings	\$35,177,393	\$16,563,854
November earnings	36,443,543	16,990,968
December earnings	34,347,411	17,677,966

Total earnings after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants and interest on bonds of the subsidiary companies 105,968,347 51,232,788
Less charges and allowances for depreciation:

Sinking funds on bonds of subsidiary companies and depreciation and extraordinary replacement funds 7,918,254 8,729,053
Sinking funds on U. S. Steel Corporation bonds 1,728,483 1,650,622

Net income 96,321,610 40,853,113
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding and premium on bonds redeemable under sinking funds... 5,639,648 5,687,777

Balance 90,681,962 35,165,336
Add net balance of sundry charges and receipts 129,626 794,057

Balance 90,811,588 35,959,393
Dividends for the quarter on stocks of the U. S. Steel Corporation:

Preferred, 1 3/4 per cent 6,304,920 6,304,920
Common, 1 1/4 per cent 6,353,782 6,353,781
Common, extra, 1 3/4 per cent 8,895,294

Surplus for the quarter \$69,257,592 \$23,300,692

Surplus for the year \$201,935,749 \$44,215,717

The declaration of the extra dividend of 1 3/4 per cent on the common stock just made brings the total payments for the year on that class of stock up to 8 3/4 per cent.

Inland Steel Company's Annual Meeting

At the annual meeting of the Inland Steel Company, in Chicago, Jan. 30, the recommendation of the directors relative to reorganization was approved. A corporation to be known as the Inland Steel Company will be formed under the laws of Delaware with an authorized capital stock of \$30,000,000 to take over and carry on the business now conducted by the present company. Stock to the amount of \$25,000,000 is to be issued to present stockholders who will receive two and one-half shares of the new stock for one share of the old. The new shares will have a par value of \$100 each. The remaining \$5,000,000 of stock is to be held in the treasury subject to the disposition of the board of directors.

The present officers and directors of the company were re-elected. The financial statement for the year showed total profits of \$11,365,477. The surplus for the year was \$9,650,879, bringing the total surplus up to \$16,359,410. The company has \$2,440,105 in cash. The directors declared a cash dividend of \$5 per share.

The American Rolling Mill Company, Middletown, Ohio, is having plans prepared for the erection of a large administration building on a site opposite its present offices. The building will be fireproof, of brick and steel construction. In addition to housing the office force, a large auditorium is planned for business and social meetings of employees.

CONTENTS

Electric Furnace in the Brass Foundry.....	301
The Field of the Electric Furnace.....	305
Molybdenum in the United States.....	305
Plant for Pressing and Welding Steel.....	306
Corrosion of Panama Canal Machinery.....	309
Local Surface Hardening of Gear Teeth.....	309
Internal Small Part Grinding Machine.....	310
Table for Calculating Tensile Testing Results.....	310
Pipes of Electrolytic Iron.....	310
New Multiple-Spindle Drilling Machine.....	311
Machinists' Screwdriver with Square Shank.....	311
The Seasoning of Iron Castings.....	312
W. M. Bailey Assistant to President Dinkey.....	313
Two-Belt Finishing Machine	314
Factory Window Sashes	315
New Powdered Coal Process.....	316
A New Form of Optical Pyrometer.....	316
A 12-In. Speed Lathe with Belt Drive.....	317
Portable Bandwheel Grinding Machine.....	317
All Rifle Manufacture Subject to Tax.....	317
The Foreign Trade Aspect of the Tariff.....	318
Co-operation in Trade After the War.....	320
Greatest of Foreign Trade Conventions.....	322
Editorials:	
Class and Sectional Taxation.....	326
Europe's Future Machinery Demand	326
Stimulating Railroad Development	327
Teaching Workmen Accident Risk.....	328
An Appeal to Industrial Laboratories.....	328
The Benzol and Toluol Markets.....	328
The Tax on Business Gains.....	329
Heavy Rail Exports	329
American Pig Iron Association Meeting.....	329
Locomotive Orders	329
Navy Shell Contracts	330
Steel Corporation's Earnings	331
Inland Steel Company's Annual Meeting.....	331
Personal	332
National Acme Company's Directors.....	333
Bosch Magneto Purchasing Department.....	333
Iron and Steel Markets	334
Iron and Industrial Stocks	345
Finished Iron and Steel Prices, Pittsburgh.....	346
Metal Markets	347
No Bethlehem Bonds Soon.....	351
The U. S. Steel Pension Fund.....	351
Bridgeport Employers' Association	351
Obituary	352
Splegeleisen from Virginia Manganese Ores.....	352
New Norwegian Pig-Iron Plant.....	352
Society of Terminal Engineers.....	352
The Air Reduction Company.....	352
The Basic Steel Company's Plans.....	353
Malleable Foundry at Saginaw.....	353
Ferromanganese Imports in December.....	353
Farewell Dinner to W. A. Field.....	353
British Steel Exports	354
Milliken Bros. Plant Sold	354
Wage Advances and Strikes	354
Pittsburgh and Nearby Districts	355
Interstate Foundry, Cleveland, Changes Hands.....	355
Machinery Markets and News of the Works.....	356
Judicial Decisions	360

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has received contracts for a large amount of piping work in connection with the new 128-in. plate mill now being installed in the Soho works of the Jones & Laughlin Steel Company, Pittsburgh.

PERSONAL

D. D. Hull, Jr., was elected vice-president of the Virginia Iron, Coal & Coke Company at a meeting of the board of directors in New York, Jan. 23. His headquarters will be at Roanoke, Va. He was born at Marion, Va., and is 44 years old. He completed the college course at Emory and Henry College, and later graduated in law at the University of Virginia. He practised his profession at Pulaski and then at Bristol, Va., and at the latter place was the unanimous choice of the bar for judge of the Corporation Court, a position he was unable to accept on account of professional engagements. While at Bristol he was a member of the law firm of Bullitt, Kelly & Hull, and was general counsel of the Virginia & Southwestern Railway until he moved to Roanoke in 1908. Since 1903 he has been general counsel for the Virginia Iron, Coal & Coke Company and allied interests the duties of which position he will continue to discharge in connection with his new responsibilities as vice-president.

Francis B. Dutton has resigned as superintendent of the Lebanon, Pa., furnaces of the Bethlehem Steel Company to become general superintendent of the Wharton Steel Company plant at Wharton, N. J., recently acquired by J. Leonard Repleglo and associates.

Officers have been elected by the Knoxville Iron Company, Knoxville, Tenn., as follows: Morrow Chamberlain, president; W. P. Davis, general manager; Otis A. Brown, secretary and treasurer; E. D. Addix, assistant general manager; W. O. Schaad, assistant secretary and treasurer.

The Lebanon Valley Iron & Steel Company, Lebanon, Pa., has re-elected all directors except W. W. Light, whose place was taken by John C. Brown. At the organization meeting of the board W. C. Sproul was elected president; Felton Bent, vice-president; Howard Longstreth, secretary and treasurer; John C. Brown, general manager.

E. J. Parrock, formerly connected with the steam engineering department of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has resigned to accept a position with the Canadian Steel Corporation, which is building a plant at Ojibway, Canada.

W. S. Rogers has resigned as president of the Bantam Anti-Friction Company, Bantam, Conn., and has been succeeded by Miss Nellie M. Scott, formerly secretary and treasurer. Miss Scott also becomes general manager. Miss Ruth Edwards has been made treasurer. L. J. Nickerson has retired as vice-president. Henry Edwards becomes vice-president and C. B. Heath secretary. Mr. Rogers will retain his position as chairman of the board of directors and act in an advisory capacity.

Richard Peters, Jr., formerly with W. J. Rainey, coal and coke, New York, has succeeded C. E. Bertie as assistant to George R. Sullivan, Philadelphia manager of Rogers, Brown & Co.

William N. Wyeth, formerly of the U. S. Metal & Mfg. Company, is now associated with Luria Brothers & Co., 50 Church Street, New York, who, owing to increased business, have had to enlarge their force of salesmen.

Harris Whittemore, Naugatuck, Conn., and Royal Victor, of the law firm of Sullivan & Cromwell, New York, were elected directors of the American Brass Company at the quarterly meeting held in New York Jan. 25. Mr. Whittemore takes the place of Alfred A.

Cowles, deceased, and Mr. Victor the place of John Sinclair, also deceased.

H. P. Binswanger, dealer in ores and minerals, has moved his offices to suite 616-617, Postal Telegraph Building, New York City.

H. I. Landis was elected president of the Lansdale Foundry Company, Lansdale, Pa., and took charge of the management of the company on Jan. 8. The company manufactures light and medium weight gray iron castings.

William P. Alexander has been placed in charge of an office which the R. H. Beaumont Company, Drexel Building, Philadelphia, builder of coal, coke and ash handling machinery, skip hoists, etc., has opened at 50 Church Street, New York City. He has been associated with the company for a number of years as field superintendent, assistant chief engineer and sales engineer.

The gear department of the Baush Machine Tool Company, Springfield, Mass., will hereafter be represented in the field by H. A. Daniels, who is thoroughly familiar with this line of business.

R. H. Wilson, who has been in charge of the steel piling department of the Walter A. Zelnicker Supply Company, in St. Louis, is temporarily representing the company at 910 Hennen Building, New Orleans.

A. R. Holmes, who in the past has occupied the position of director and secretary-treasurer, has retired from MacKinnon, Holmes & Co., Ltd., Sherbrooke, Canada. It is understood that J. W. Bowman, president, and G. D. MacKinnon, vice-president and general manager, have purchased the holdings of Mr. Holmes and his friends. New directors—Dr. A. W. Klein, Greenwich, Conn., and M. L. MacKinnon and J. Nicol of Sherbrooke—have been elected, with F. C. Johnston secretary-treasurer. The business, structural steel and plate work, will be conducted as hitherto, under the management of G. D. MacKinnon.

J. Leonard Repleglo, New York, leaves for Florida next week for a stay of several weeks.

William A. Rogers, of Rogers, Brown & Co., Buffalo, sails early in February for a four months' tour of Japan, China and Korea.

L. P. Gallagher and A. S. Rippeth have resigned as president and general manager respectively of the West Lafayette Mfg. Company, West Lafayette, Ohio. The former has been succeeded by John M. Kirk and the latter by W. T. Narragon.

William H. Bennett, advertising manager of the Searchlight Company, Chicago, has joined the forces of the Service Motor Supply Company, Fifteenth Street and Michigan Avenue, Chicago. This is occasioned by the consolidation of the Searchlight Company with the Air Reduction Company of New York City, and the removal of the Searchlight interests to the East.

R. B. Holliday, Beloit, Wis., associated for many years with Fairbanks, Morse & Co. in that city, has resigned to become assistant to John D. Bird, general superintendent of the Power & Mining Machinery Company, Cudahy, Wis.

H. L. McLaren, Racine, Wis., who recently resigned as president and general manager of the Mitchell Motors Company, has been elected president of the Racine Rubber Company, now owned by the Ajax Rubber Company, Trenton, N. J.

Henry Lindenkohl has been appointed engineer of construction for the American Locomotive Company, with headquarters at Schenectady, N. Y. He was graduated from the Stevens Institute of Technology with the degree of mechanical engineer, in 1905. The same year he entered the employ of the American Locomotive Company at Providence, R. I., as inspector of new buildings. In 1908 he was transferred to the general building construction department of the company at Schenectady, continuing since in that connection.

The Berger Mfg. Company, Canton, Ohio, announces the following appointments: R. W. Van Horn, who for the past six years has been connected with the New York branch in charge of the metal lumber department, has been transferred to the home office and placed at the head of the building material products

division. Norman A. Hill, recently efficiency engineer for the duPont Powder Company, Wilmington, Del., and formerly engaged in appraisal work for the Public Service Commission in Maryland, has been appointed efficiency engineer, with headquarters in the home office of the Berger Mfg. Company. F. V. Stonerod, formerly inspector of steel for the Carnegie Steel Company and for the past few years connected with the Berger New York branch in the capacity of construction engineer, has been placed at the head of the sidewalk light department and will be located in Canton, Ohio. A. H. Bromley, Jr., contracting engineer, who for the last several years has looked after the Berger interests in the Cleveland territory, has been appointed chief engineer of the sales department and hereafter will be located in the Canton office.

At the recent annual meeting of the Cleveland Cooperative Stove Company, Cleveland, John H. O'Brien was elected president to fill the vacancy caused by the death of N. P. McKean. Mr. O'Brien entered the employ of the company 35 years ago at the age of 14 as a stove polisher and became, in turn, salesman, office employee, secretary and general manager. He will retain his position as general manager. W. W. Ludlow, who has been treasurer, was also given the office of secretary, and John G. Gill was re-elected vice-president. James Mitchell was appointed general superintendent.

Charles Page Perin and Stewart M. Marshall announce their association as consulting engineers at 2 Rector Street, New York. Mr. Perin established offices in New York 16 years ago for engineering work in iron and steel. Mr. Marshall was formerly chief engineer of the Cambria Steel Company and more recently has been chief engineer of the Southwark Foundry & Machine Company, Philadelphia.

George M. Berry, chief chemist to the Hakomb Steel Company, Syracuse, N. Y., since that company's organization in 1905, will give a special course of lectures on metallurgy in the College of Applied Science, Syracuse University. These lectures are to be given weekly throughout the remainder of the college year and will cover the metallurgy of the non-ferrous metals and that of iron and steel.

The promotion of E. F. Roberts from general superintendent to factory manager of the Packard Motor Car Company, Detroit, and of C. F. Tollzien, purchasing manager, to manager of production is announced. The positions of factory manager and manager of production were created to meet the demands of the increased business.

Lloyd Brown, who has had charge of the sales of the Lakewood Engineering Company in Philadelphia for several years, has returned to the company's general offices in Cleveland as manager of sales of the car and factory truck department.

The Standard Gage Steel Company, Beaver Falls, Pa., at its annual meeting, Jan. 23, elected the following officers: President, Alex Gilliland; vice-president, Stephen Moltrup; general manager and secretary, J. M. Reed; assistant general manager and sales manager, John J. Tyler; treasurer, John Beavan; assistant secretary, J. W. Robison.

Samuel Mather of Pickands, Mather & Co., Cleveland, and William G. Mather, Cleveland-Cliffs Iron Company, leave this week for California, where they will spend the remainder of the winter.

Julian Kennedy, engineer in charge of the design and construction of the new plant of the Keystone Steel & Wire Company, Peoria, Ill., has retained Barton R. Shover, Diamond Bank Building, Pittsburgh, as consulting electrical engineer on the application of power to the equipment for that plant.

Edward W. Norris, recently with the Southwark Foundry & Machine Company, Philadelphia, Pa., has been appointed sales engineer in the New York office of the Mead-Morrison Mfg. Company.

John O. Heinze has joined the Simms Magneto Company, East Orange and Bloomfield, N. J., as engineer and production manager.

Charles B. Rearick, manager of sales for the Covington Machine Company, Covington, Va., has been made vice-president and manager of the company.

Charles R. Courtenay, formerly superintendent and chief draftsman with the Watertown Engine Company and lately with the New York Engine Company, and Robert E. Cahill have formed a partnership to conduct business under the name of the Watertown Engine & Machine Company, which will make a specialty of repairs and replacements to Watertown engines and boilers, and in addition will do engineering work along the line of testing and adjusting power plant apparatus.

Albert Broden has resigned as vice-president and director of the Seaboard Steel & Manganese Corporation, also as manager of Temple furnace. Mr. Broden will spend February and March in New Orleans and southern California, and on his return to Temple, Pa., will devote himself to the selling of Swedish iron ore and to the purchase of bituminous coal for consumers in Sweden. Of interest in connection with the future shipment of Swedish ores to the United States is the contract recently entered into by Trafikaktiebolaget Grangesberg-Oxelosund for 18 steamers to be built in Sweden at a cost of 40 million kroner. The first four will be delivered early in 1918. Each will have a carrying capacity of 8000 tons.

G. W. Wagstaff has associated himself with the Onondaga Steel Company, Syracuse, N. Y., and will represent the company in northern Ohio, northern Pennsylvania, Buffalo and Detroit. He formerly represented the Bethlehem Steel Company in the northern Ohio territory.

At a meeting of the directors of J. G. White & Co., Inc., New York, Douglas I. McKay and Sanger B. Steel were elected vice-presidents. Mr. McKay, who at one time was police commissioner of New York City, has been connected with the corporation for over two years as assistant to the president.

National Acme Company's Directors

Reorganization of the National Acme Company, Cleveland, Ohio, successor to the National-Acme Mfg. Company, was completed at the annual meeting Jan. 25. The new directorate represents the old Cleveland organization and the new Eastern interests. Thirteen directors were elected, including seven new directors, as follows: C. S. Eaton, Otis & Co., Cleveland; Albert H. Wiggin, president Chase National Bank, New York; Galen L. Stone, Hayden, Stone & Co., Boston; Herbert Lowell Dillon, Eastman, Dillon & Co., New York; W. F. McGuire, Detroit, and A. W. Hopkins and W. R. Mitchell, members of the staff of the Acme Company. C. S. Eaton was elected as a new member of the executive committee. Other members of that committee elected were W. D. Alexander, president; W. F. McGuire; H. F. Goff, president Cleveland Trust Company; E. C. Henn, vice-president and general superintendent, and A. W. Henn, secretary and treasurer.

Bosch Magneto Purchasing Department

The Bosch Magneto Company, New York City, has reorganized its purchasing department to take effect Feb. 1. In the future the purchasing for the factories at Springfield, Mass., and Plainfield, N. J., will be handled from the former point. The work of the department will be divided, the purchase of product material which includes all material and parts entering directly into the products of the company being in charge of S. T. Plimpton, purchasing agent, assisted by John Pauly. Non-product material including equipment and supplies will be purchased by P. G. Puffer, assisted by C. E. Spalding. All of the accounting for both plants will be handled from Springfield in the future.

The Railroad Commission of Wisconsin has promulgated an order abolishing the maximum distance tariffs and substituting a new distance class rate tariff on all intrastate business in Wisconsin. The reduction amounts to from 5 to 30 per cent on different classes of freight, and becomes effective May 1. The order is made in response to the complaint of J. N. Tittemore, Omro, Wis., representing shipping interests in the Fox River Valley, which was filed Nov. 8, 1915. Large shippers are not materially benefited because the great bulk of intrastate traffic moves on commodity rates.

Iron and Steel Markets

NO RELIEF FOR TRAFFIC

Large Earnings in Spite of Handicap

Some Postponement of Rolling Mill Equipment Work—Pig Iron Firmer

Still beset by traffic troubles, the steel trade has had one of the quietest weeks in many, though January ends with even more assurance of full operations far into the year than existed at its opening.

That the United States Steel Corporation, with all the constriction of traffic late in the year and the shortage of coke, earned \$106,000,000 in the last quarter of 1916, or far more than in the previous three months, indicates the advance the steel companies have made into their higher priced orders. But even so, considerable shipments are still going out at close to a 2c. basis for heavier products; hence larger earnings are yet to come.

Though the Pittsburgh & Lake Erie embargo on Pittsburgh-Youngstown shipments came off Jan. 31, Pittsburgh district shippers look for no great clearing up of the railroad situation before April. Coke supply is alternately better and worse, and pig iron producers who must go into the market and pay \$9 for coke to keep running, though they have contracts for coke at \$4, are far from being satisfied with that particular phase of prosperity.

In the Pittsburgh district some mills are believed to have shipped more product in the past fortnight than they booked in new business, but generally the cutting down of shipments has caused a slight gain in unfilled orders in January. At Chicago, consumers of the heavier forms of rolled steel have crowded the mills with specifications and emergency orders, so that even in the absence of large new contracts the accumulation on the books has increased.

In the Central West there is a slight easing up of the pressure on sheet and bar mills. Some sheet mills that have been quoting the top of the market for prompt shipment are now taking such business as much as \$5 lower. On heavier products, however, prices on both early and later shipments are firm if not higher.

The desire of foreign buyers to get all the steel possible from this country is seen here and there in the acceptance of more steel with upper limits in phosphorus and sulphur. In a recent inquiry for 40,000 tons of 4½-in. rounds 0.07 was allowed on phosphorus and sulphur.

Italy's inquiries for barb wire, steel bars and

ship plates continue, but ocean freights are a distinctly limiting factor in all export trade. The large French car contracts are still in abeyance, but are expected to come out soon. Rail buying for export is slow in developing, though some large tonnages have overhung the market for weeks.

Pittsburgh reports of the postponement of some large rolling mill and steel works equipment work, including a plate mill, are the first definite development in that direction. It is not that the proposed construction has been abandoned, but that lower prices on equipment are awaited.

January has been unusual in locomotive orders, the total being above 600. At 16,000 the month's car orders fell nearly one-third below those for January, 1916. The Pennsylvania Railroad's program calls for 2100 freight cars and 225 locomotives to be built at Altoona.

In pig iron, the tendency is still toward stiffer prices, due in part to foundries being forced into the market because of shortages on contract shipments. Mahoning and Shenango Valley furnaces are now generally on a \$32 basis for No. 2 iron. Prompt Southern iron is \$24, Birmingham, while for the second half it can be had at \$23.

With a predicted shortage of Bessemer ores, very definite figures being put out in some quarters, the effort to get 100,000 tons of Bessemer pig iron for export at \$35 at seaboard has made no great progress. Sales of 1000 and 1500 tons have been made at \$35 at Valley furnaces. A sale of 16,000 tons of basic iron in the Central West is reported at \$30, delivered.

Pittsburgh

PITTSBURGH, PA., Jan. 30, 1917.

The car situation in this district is not any better. On some days the supply of cars is fair, but at other times it is not more than 10 to 15 per cent of the needs of shippers. The Pittsburgh & Lake Erie, running from Pittsburgh to Youngstown, has announced that all embargoes in the Youngstown district would be lifted to-morrow. If this be done, it will relieve the local situation a great deal. Some Pittsburgh shippers claim they are not getting more than 50 per cent of their actual needs of cars, and they do not look for the situation to be much better before April. General conditions in the steel trade have quieted considerably. Buying is light, and specifications against contracts in some lines—notably sheets and steel bars—have fallen off. Reports also are that some large contracts for rolling-mill and steel-works equipment have recently been postponed and that little new business of this kind is being placed. One Eastern steel company is reported to have canceled or postponed about \$5,000,000 worth of steel-works equipment, including a plate mill that was to have cost

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

	Jan. 31,	Jan. 24,	Dec. 27,	Jan. 26,
	1917.	1917.	1916.	1916.
Pig iron, Per Gross Ton:				
No. 2 X, Philadelphia...	\$30.50	\$30.50	\$29.50	\$20.00
No. 2, Valley furnace...	31.00	31.00	31.00	18.50
No. 2, Southern, Cin'ti...	26.00	25.90	25.90	17.90
No. 2, Birmingham, Ala...	24.00	23.00	23.00	15.00
No. 2, furnace, Chicago*...	30.00	30.00	30.00	18.50
Basic, del'd, eastern Pa...	30.00	30.00	30.00	19.50
Basic, Valley furnace...	30.00	30.00	30.00	17.75
Bessemer, Pittsburgh...	35.95	35.95	35.95	21.45
Malleable Bessemer, Ch'go*...	31.00	31.00	30.00	19.00
Gray forge, Pittsburgh...	29.95	29.95	29.95	18.45
L. S. charcoal, Chicago...	31.75	31.75	31.75	19.75
Rails, Billets, etc., Per Gross Ton:				
Bessemer, rails, heavy, at mill	38.00	38.00	38.00	28.00
O-h. rails, heavy, at mill	40.00	40.00	40.00	30.00
Bessemer, billets, Pittsburgh...	65.00	65.00	60.00	32.00
O-h. billets, Pittsburgh...	65.00	65.00	60.00	33.00
O-h. sheet bars, P'gh...	65.00	65.00	60.00	35.00
Forging billets, base, P'gh	85.00	80.00	80.00	55.00
O-h. billets, Phila...	60.00	60.00	60.00	42.00
Wire rods, Pittsburgh...	75.00	75.00	70.00	45.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia...	3.159	3.159	3.159	2.259
Iron bars, Pittsburgh...	3.25	3.25	3.25	2.00
Iron bars, Chicago...	3.00	3.00	3.00	1.90
Steel bars, Pittsburgh...	3.25	3.25	3.00	2.10
Steel bars, New York...	3.419	3.419	3.169	2.269
Tank plates, Pittsburgh...	4.50	4.50	4.25	2.25
Tank plates, New York...	4.669	4.669	4.419	2.519
Beams, etc., Pittsburgh...	3.25	3.25	3.25	1.90
Beams, etc., New York...	3.419	3.419	3.419	2.069
Skelp, grooved steel, P'gh	2.85	2.85	2.85	1.90
Skelp, sheared steel, P'gh	3.00	3.00	3.00	2.00
Skelp, hoops, Pittsburgh...	3.25	3.25	3.25	2.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

over \$2,000,000. For the first time in many months, it is believed that shipments of some mills are possibly slightly in excess of new orders. The supply of semi-finished steel is still much below the needs of the trade, and likely will be for some time. Prompt semi-finished steel can hardly be had at any price, and consumers are suffering because of slow deliveries by the mills. There were no advances in prices the past week, and the market on everything is as strong as it has been, with the exception of scrap, which is neglected. Stocks of finished iron and steel in warehouses and mill yards are steadily getting larger, due to the shortage in cars and motive power.

Pig Iron.—As far as known, no part of the inquiry from J. P. Morgan & Co. for 100,000 tons of Bessemer iron for export has been taken up by Valley furnaces. In fact, there is an acute shortage in the supply of Bessemer iron and it is also said there will be a shortage this year in supply of Bessemer ores. Producers of Bessemer iron are therefore watching their sales closely, especially those buying their ore in the open market. Most of the inquiry for Bessemer, basic and foundry iron is from concerns that some time ago covered their needs over the first half of this year, but are not getting good deliveries on their contracts; they are coming in the market and buying odd lots for prompt shipment. One open-hearth steel plant has bought lately about 1600 tons, for part of which it paid about \$30, delivered, and for 500 tons it paid \$30 at Valley furnace. There have been several sales of small lots of Bessemer at \$35, Valley furnace, while No. 2 foundry has sold at \$35, or higher, in small lots for prompt shipment, buyers paying a premium to get quick delivery. The amount of pig iron being sold is relatively small, but prices are very firm. Quotations are as follows: Standard Bessemer iron, \$35; basic, \$30 to \$31; gray forge, \$29; malleable Bessemer, \$30; and No. 2 foundry, \$31 to \$32; all at Valley furnace, the freight rate to the Pittsburgh or Cleveland district being 95c. per ton. We note sales of two lots of 300 tons each of Bessemer iron, one sale of 1000 tons and another of 1500 tons, all at \$35, Valley furnace, and for delivery before July 1. Reports that 1500 tons of Bessemer for resale was being offered at less than \$35 are

Sheets, Nails and Wire,	Jan. 31,	Jan. 24,	Dec. 27,	Jan. 26,
Per Lb. to Large Buyers:	1917.	1917.	1916.	1916.
Sheets, black, No. 28, P'gh	4.50	4.50	4.50	2.60
Sheets, galv., No. 28, P'gh	6.25	6.25	6.25	4.75
Wire nails, Pittsburgh...	3.00	3.00	3.00	2.20
Cut nails, Pittsburgh...	3.50	2.95	2.95	2.10
Fence wire, base, P'gh...	2.95	2.95	2.95	2.05
Barb wire, galv., P'gh...	3.85	3.85	3.85	3.05

Old Material, Per Gross Ton:

Old Material, Per Gross Ton:	Jan. 31,	Jan. 24,	Dec. 27,	Jan. 26,
Per Lb. to Large Buyers:	1917.	1917.	1916.	1916.
Iron rails, Chicago...	\$27.00	\$27.00	\$27.00	\$17.50
Iron rails, Philadelphia...	28.00	28.00	28.00	19.50
Carwheels, Chicago...	18.50	18.50	20.00	14.25
Carwheels, Philadelphia...	20.50	21.00	22.00	16.50
Heavy steel scrap, P'gh...	22.00	23.00	24.00	17.50
Heavy steel scrap, Phila...	20.50	21.00	23.00	16.50
Heavy steel scrap, Ch'go...	21.00	21.00	21.50	15.25
No. 1 cast, Pittsburgh...	19.00	19.00	21.00	15.75
No. 1 cast, Philadelphia...	20.00	20.00	21.00	17.00
No. 1 cast, Ch'go (net ton)	15.50	15.50	15.50	13.00
No. 1 RR, wrot, Phila...	26.00	26.00	27.00	22.00
No. 1 RR, wrot, Ch'go (net)	23.50	23.50	23.50	15.75

Coke, Connellsville, Per Net Ton at Oven:

Coke, Connellsville, Per Net Ton at Oven:	\$8.50	\$8.50	\$9.50	\$3.00
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Furnace coke, prompt...	8.50	8.50	9.50	3.00
Furnace coke, future...	6.00	6.00	4.50	2.50
Foundry coke, prompt...	10.00	10.00	10.00	3.50
Foundry coke, future...	7.00	7.00	6.00	3.25

Metals,

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	33.00	31.00	31.00	25.50
Electrolytic copper, N. Y.	33.00	31.00	31.00	25.37 1/2
Spelter, St. Louis	10.50	9.87 1/2	9.50	19.00
Spelter, New York	10.75	10.12 1/2	9.75	19.25
Lead, St. Louis	8.00	7.62 1/2	7.30	6.00
Lead, New York	8.15	7.75	7.50	6.10
Tin, New York	45.75	45.50	40.87 1/2	42.12 1/2
Antimony (Asiatic), N. Y.	23.00	15.00	14.00	4.00
Tin plate, 100-lb. box, P'gh	\$7.00	\$7.00	\$7.00	\$3.75

denied. It is claimed that Bessemer has been sold in a few cases at above \$35.

Billets and Sheet Bars.—The pressure for deliveries of billets and sheet bars is as insistent as ever. At several steel plants large quantities of billets and bars are piled up awaiting cars for shipment. Mills are not endeavoring to make new sales of steel, as they have practically none to spare, but are bending their entire energies to trying to get out steel already sold. There would be no trouble in getting \$65 or higher for soft Bessemer or open-hearth billets or sheet bars if the buyer was assured he would get the steel. A sale is reported of about 200 tons of forging billets at about \$85, Pittsburgh, and as high as \$88 has been quoted lately on some new inquiries. We quote soft Bessemer and open-hearth billets and sheet bars at \$65 to \$70 per ton, maker's mill, Pittsburgh or Youngstown; forging billets, \$85 to \$90 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25.

Ferroalloys.—There is a continued active inquiry for ferromanganese, and prices are very firm. English 80 per cent is held at \$164, seaboard, with no guarantee as to deliveries, while domestic is held at \$170 to \$175, at furnace, one leading maker holding at \$175 minimum and reporting several fairly large sales at that price. There is also a continued scarcity in the supply of 50 per cent ferrosilicon, and dealers who have any on which they can make prompt shipments can readily get 5c. to 6c. per lb. for it, or even more. We quote 18 to 22 per cent spiegeleisen at \$60 to \$65, and 25 to 30 per cent at \$70 to \$80, delivered; 9 per cent ferrosilicon, \$39 to \$41; 10 per cent, \$40 to \$42; 11 per cent, \$41 to \$43; 12 per cent, \$42 to \$44; 13 per cent, \$43.50 to \$45.50; 14 per cent, \$45.50 to \$47.50; 15 per cent, \$47.50 to \$49.50, and 16 per cent, \$50 to \$52; 7 per cent silvery, \$29.50 to \$30; 8 per cent, \$30 to \$31; 9 per cent, \$30.50; 10 per cent, \$31; 11 per cent, \$32, and 12 per cent, \$33. These prices are f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., all of which have a freight rate of \$2 per gross ton to the Pittsburgh district.

Structural Material.—Some fairly large jobs have been given out. Some time ago the American Bridge Company took 20,000 tons or more of steel for some

new buildings for the Ford Motor Company, Detroit, Mich., and about 20,000 tons for the same concern for export to Great Britain, but deliveries on these contracts have not yet started. The Pennsylvania Lines West has placed about 600 tons of bridge work, one order for 300 tons for a new bridge at New Brighton, Pa., going to the Fort Pitt Bridge Works, while another for about 300 tons was divided between this fabricator and the King Bridge Company, Cleveland. Bids are being taken for a new bank building at Charleston, W. Va., about 1200 tons. The price of the Carnegie Steel Company on beams and channels up to 15 in. has been advanced \$5 per ton, or to 3.25c. at mill for indefinite delivery. On contracts for shipment late in the second quarter and third quarter, another interest is quoting 3.25c. to 3.50c. at mill. Prices on small lots of beams and channels from warehouse range from 3.50c. to 4c. and higher, depending on the quantity.

Plates.—The Carnegie Steel Company has recently taken about 20,000 tons of plates and small shapes for delivery to the various navy yards. This material is to be used in repair work, and deliveries are to run over all of 1917. That company is now quoting 3.75c. on $\frac{1}{4}$ -in. and heavier sheared plates, with no promise of definite delivery. It is understood the Standard Steel Car Company, Butler, Pa., has taken about 4900 steel cars for France, and has placed the material, 35,000 to 40,000 tons, with a local mill. Deliveries on these cars are to be made late this year. The Pennsylvania Railroad announces that it will shortly place orders at its Altoona shops or outside for the building of 2100 freight cars, 92 passenger cars and 225 locomotives. All this equipment will be used to replace cars and locomotives now in service, but which are worn out. New inquiry for steel cars has been quiet. We quote $\frac{1}{4}$ -in. and heavier sheared plates at 3.75c. at mill, with no promise of delivery, while mills that can ship late in second quarter and in third quarter are quoting from 4c. to 4.50c. at mill for desirable orders. Small lots for fairly prompt shipment are quoted at 5c. and higher at mill.

Steel Rails.—The Carnegie Steel Company has taken 5000 tons of standard sections for the Michigan Central, 5000 tons for the Philadelphia & Reading and 10,000 tons for the Pittsburgh & Lake Erie, all for 1918 delivery. The new demand for light rails is fairly active, running 4000 tons or more per week. We quote light rails as follows: 25 to 45 lb., \$50; 16 to 20 lb., \$51; 12 and 14 lb., \$52; 8 and 10 lb., \$53, in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at \$38, and open-hearth, \$40, per gross ton, Pittsburgh.

Sheets.—It is understood, but not officially confirmed, that the Ford Motor Company has closed for a part of its large inquiries for sheets to cover the manufacture of about 1,000,000 automobiles. Definite details of these contracts cannot be secured, but it is said deliveries run over all of this year and in first half of 1918. This company is buying more than double its usual quantities of sheets, steel bars and other materials. Its contracts for sheets will be divided among five or six mills, one leading interest taking upward of a third of the order. The new demand for sheets is only fairly heavy and premiums heretofore paid for fairly prompt delivery are disappearing to some extent. Quite large sales of No. 28 Bessemer black sheets have been made at 4.50c. to 4.75c., and of No. 28 galvanized at 6.50c. to 6.75c. at mill for fairly prompt shipment. Consumers are largely covered over the first half of this year and specifications are heavy. We quote blue annealed sheets, Nos. 3 to 8, at 4c. to 4.25c.; box annealed, one pass, Bessemer cold-rolled sheets, No. 28, 4.50c. to 5c.; No. 28 galvanized, 6.25c. to 7.50c.; No. 28 tin-mill black plate, 4.25c. to 4.50c., all f.o.b. mill, Pittsburgh. These prices are for carloads or larger lots, and the higher prices quoted are for reasonably prompt shipment.

Tin Plate.—It is said a contract has been placed with a leading mill for 50,000 to 60,000 boxes of tin plate for shipment to France at about \$7.50 per base box at mill. The new domestic inquiry is light, as most consumers are covered over the first half and some for practically the entire year. Output is being kept down to some extent by slow deliveries of sheet bars. Three or four of the leading tin-plate makers have covered their needs of sheet bars with a leading interest over

the next five years on a sliding scale basis. Two of them had contemplated the erection of steel plants of their own, but have given the project up because of favorable contracts they were able to make for bars. On current orders prices range from \$7 to \$7.50 per base box at mill. We quote I. C. terne plate, 107 lb., at \$7.15 to \$7.65, and 200 lb., carrying 8-lb. coating, at \$11, the usual advances applying for heavier weights and coatings.

Shafting.—Consumers are now largely covered on their needs for the first half and specifications are reported fairly active. In 1916 several makers of shafting largely increased their capacity, and partly for this reason they have caught up to some extent on back orders and are now able to make deliveries in 60 to 90 days. We quote cold-rolled shafting at 20 to 15 per cent off in carload lots and 10 per cent off in less than carload lots for first quarter and first half, f.o.b., Pittsburgh, freight added to point of delivery.

Railroad Spikes and Track Bolts.—The new demand is fairly active, and the price of \$3.40 per 100 lb. for base sizes of spikes is being firmly held. Several Western roads have lately placed about 15,000 kegs of spikes with local makers for delivery in the second half at the full price of \$3.40 for standard sizes. The demand for both spikes and track bolts is almost entirely for second half delivery. We quote track bolts with square nuts at 4.85c. to 5c. to railroads and 5c. to 5.25c. in small lots to jobbers, base. Railroad spikes, 9/16 in. and larger, \$3.40, base; 7/16 and $\frac{1}{2}$ in., \$3.50, base; 5/16 and $\frac{3}{8}$ in., \$3.75, base. Boat spikes, \$3.65, base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products.—Mills report a moderate demand for wire and wire nails, and specifications against contracts are not so heavy as they were recently. In many sections the country roads are almost impassable, and the movement of wire and wire nails to the country trade is therefore light. Prices on wire nails are firm at \$3, and on annealed wire \$2.95, but nothing further is heard of an advance. Some contracts for wire nails at \$3.10 and even up to \$3.25, were taken some time ago, but all new business is now on the \$3 basis. We quote: Wire nails, \$3, base, per keg; galvanized, 1 in. and longer, including large head barbed roofing nails, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire is \$3.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$2.95; galvanized wire, \$3.65; galvanized barb wire and fence staples, \$3.85; painted barb wire, \$3.15; polished fence staples, \$3.15; cement-coated nails, \$2.90, base, these prices being subject to the usual advances for the smaller trade, all f.o.b., Pittsburgh, freight added to the point of delivery, terms 60 days' net, less 2 per cent off for cash in 10 days. Discounts on woven wire fencing are 53 per cent off list for carload lots, 52 per cent for 1000-rod lots, and 51 per cent for small lots, f.o.b., Pittsburgh.

Wire Rods.—The supply of rods is not nearly enough to meet the demand. Soft Bessemer and open-hearth rods in quite large lots have sold at \$75 at mill, and higher. The export demand, especially from Canada, continues heavy. We quote soft Bessemer, open-hearth and chain rods at \$75 to \$80, at maker's mill, Pittsburgh. For high-carbon rods, prices range from \$90 to \$110, and several fairly large sales of acid open-hearth rods of high carbon have been made at the higher price.

Iron and Steel Bars.—Some falling off in the new demand for steel bars is noted, and specifications against contracts are not so active as some time ago. However, leading steel-bar mills are filled up for the first half, and several for practically all they will make this year. The Carnegie Steel Company advanced plates and shapes \$5 per ton last week, but allowed its price on steel bars to remain at 3c., though with no promise of definite delivery. The new demand for reinforcing steel bars and also for iron bars is fairly heavy, and the mills are sold up for some months ahead. We quote steel bars at 3c. to 3.10c. at mill for second and third quarter delivery. We quote refined iron bars at 3.25c. and railroad test bars at 3.40c. in carload lots, f.o.b., Pittsburgh.

Rivets.—While the domestic demand is quite active, the export demand is heavy and large foreign orders could be secured if cars could be had in which to make

shipments to seaboard. Consumers are specifying freely on contracts. Prices are firm, and on less than carload lots 10c. to 15c. per 100 lb. is readily paid over the usual carload price. Makers quote buttonhead structural rivets, $\frac{1}{2}$ in. in diameter and larger, \$4.25 per 100 lb., base, and conehead boiler rivets, same sizes, \$4.35 per 100 lb., base, f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent for cash in 10 days.

Nuts and Bolts.—The domestic demand is not large, as most consumers are covered over the first quarter and some over the first half. Shipments are unsatisfactory, however, owing to the shortage in cars and motive power. Great stocks of filled kegs are piled up in warehouses awaiting shipment. Prices are firm. Discounts are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 and $2\frac{1}{2}$ per cent; large, 30 and 5 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 50 per cent; small, cut thread, 40 and 10 per cent; large, 35 and 5 per cent.

Machine bolts, c. p. c. and t. nuts, small, 40 per cent; large, 30 per cent. Bolt ends, h. p. nuts, 35 and 5 per cent; with c. p. nuts, 30 per cent. Lag screws (cone or gimlet point), 50 per cent.

Nuts, h. p. sq. and hex., blank, \$2.50 off list, and tapped, \$2.30 off; nuts, c. p. c. and t. sq. blank, \$2.10 off, and tapped \$1.90 off; hex., blank, \$2.25 off, and tapped, \$2 off. Semi-finished hex. nuts, 50, 10 and 5 per cent. Finished and case-hardened nuts, 50, 10 and 5 per cent.

Rivets 7/16 in. in diameter and smaller, 40 and 10 per cent.

Hoops and Bands.—The demand is not so active as some time ago, as consumers are well covered for the first quarter and some the first half. Specifications are coming in freely. The nominal price of the Carnegie Steel Company on steel hoops is 3.50c., and on steel bands 3c., with extras on the latter as per the steel-bar card. Other mills that can ship fairly promptly are quoting 3.50c. to 3.75c. on hoops and up to 3.25c. on steel bands.

Cold-Rolled Strip Steel.—Makers have not yet formally opened their books for the second quarter. Some consumers, however, whose lines of products necessitated their knowing what their material would cost them, have been allowed to cover on second quarter contracts at \$7 per 100 lb., the price for the first quarter having been \$6.50. General conditions are quiet, December and January always being the two dullest months in this trade. Consumers are specifying moderately against contracts. We quote cold-rolled strip steel for first quarter on contracts at \$6.50, and second quarter at \$7 per 100 lb. On current orders for reasonably prompt shipment makers quote \$7 for fair-sized quantities up to \$7.50 per 100 lb. for small lots. Terms are 30 days net, less 2 per cent off for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Wrought Pipe.—The contract of the Sinclair Oil & Refining Company for 500 miles of 8-in. pipe, noted in this report last week, was placed with the National Tube Company. The pipe will be delivered in the coming summer. Several other large oil and gas line projects are in the market, but are not yet ready for mention. On lap-weld sizes of both iron and steel pipe, mills are well sold up over the remainder of this year, but on butt-weld sizes they can ship in three or four weeks. Prices on both iron and steel pipe are very firm. Discounts are given on another page.

Boiler Tubes.—Nearly all consumers of both locomotive and merchant tubes are covered over the first half and some for the entire year. Tubes for prompt shipment are scarce and readily bring premiums. Locomotive shops are specifying heavily on contracts. One leading maker of steel locomotive tubes has its entire output sold up for all of this year. Discounts, which are largely nominal, are given on another page.

Coke.—Reports as to the car situation in the coke

trade are conflicting. Some producers say their supply of cars last week was better than for some time, while others say it was worse. Deliveries to blast furnaces continue slow, and this is creating some spot demand for furnace coke. Best grades of furnace coke for prompt shipment range from \$8 to \$9 per net ton at oven, depending largely on the quality of the coke and the ability of the shipper to get cars. A shipper who has furnace coke loaded on cars can get \$9 for it. The supply of labor in the coke regions is not plentiful, and this, with the bad car situation, is holding down the output. Some shippers do not expect the car situation to be much better before April. Railroads entering the coke region refuse to allow their cars to be loaded with coke to be delivered to another line, insisting that their cars must be kept on their own tracks. On contracts dealers are quoting furnace coke at \$6 to \$7 per net ton at oven for delivery over the first half, but no contracts are being closed at these prices. Best grades of 72-hr. foundry coke are held at \$10 to \$11 per net ton at oven for prompt shipment and \$7 to \$8 on contracts. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ended Jan. 20 as 347,490 net tons, a decrease over the previous week of 5702 tons.

Old Material.—The slight betterment in the scrap trade noted in this report last week did not last long. Local conditions are now very quiet. The large consumers seem content to wait until their stocks are used before buying more. No embargoes are on to any steel plants using scrap, but all railroads are refusing to allow cars to be loaded with scrap destined for any points not on their own lines. This is making shipment largely prohibitive. There is a fair demand for low phosphorus melting stock, which is slightly higher, and also for borings, turnings and old carwheels. Quite heavy sales of low phosphorus melting stock have been made at prices ranging from \$32.50 to \$33.50 per gross ton, delivered. We note a sale of 1200 tons of shrapnel scrap at \$28.70, delivered. A sale of 500 tons of turnings is also reported at about \$12, delivered. There is a better movement in scrap at present in Youngstown than in the immediate Pittsburgh district, and prices being realized are slightly higher there than in the local market. Prices for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, are nominally as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	\$22.00 to \$22.50
No. 1 foundry cast	19.00 to 19.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	27.00 to 28.00
Hydraulic compressed sheet scrap	18.00 to 18.50
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	15.50 to 16.00
Bundled sheet stamping scrap	15.00 to 15.50
No. 1 railroad malleable stock	19.00 to 19.50
Railroad grate barn	12.50 to 13.00
Low phosphorus melting stock	32.50 to 33.50
Iron car axles	41.00 to 42.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	47.00 to 48.00
No. 1 busheling scrap	17.00 to 18.00
Machine-shop turnings	12.00 to 12.25
Old carwheels	20.50 to 21.00
Cast-iron borings	12.25 to 12.50
*Sheet bar crop ends	25.00 to 26.00
No. 1 railroad wrought scrap	23.00 to 24.00
Heavy steel axle turnings	15.50 to 16.00
Heavy breakable cast scrap	17.50 to 18.00

*Shipping point.

Weekly quotations of jobbers' prices of electrical supplies have been made a regular feature of the *Electrical World*. The prices are net as available to electrical contractors, central stations, dealers and others engaged in the resale of the goods covered. The articles listed include armored conductors, expansion bolts, conduit fittings, white and black iron conduit, fan and power motors, electric lamps, metal molding, soldering material, switches and various kinds of electrical wire.

Chicago

CHICAGO, ILL., Jan. 30, 1917.

The manner in which the users of rolled steel in its heavier forms are crowding specifications in to the mills, in an amount greatly exceeding mill shipments, is a matter of general comment. Consumers are anxious to secure such priority as they can in the hope of the best possible deliveries, and are also seeking to establish their own contracts into which the material is to go. It is difficult to detect any diminishing of inquiry for steel, though the quantities involved do not ordinarily run into large figures, and appearances continue to indicate that the inquiry is largely occasioned by emergency needs arising out of the general congestion. Prices for far future delivery have been advanced \$3 per ton for shapes and plates, and track bolts are quoted at a minimum of 4.50c. On the other hand, some of the sheet mills, which have been quoting at the top of the market for prompt shipment, have reduced their quotations as much as \$5 per ton. Production is being considerably hampered by the fuel shortage, both coal and oil, the manufacturers of finished materials being more seriously affected in this regard. A larger business was done last week in pig iron. Sales of malleable iron, at the latter end of the week, approximated 12,000 tons, while offerings of high silicon Southern iron found takers to the amount of over 2000 tons.

Pig Iron.—A renewal of inquiry in considerable volume last week gave the market a much more active appearance. The more prominent demand was for malleable iron, and several transactions of 1500 and 2000 tons were closed. An interesting feature of this inquiry was a further demand from Canadian foundries, affording continued evidence of the sold-up condition of the Buffalo market. Prices range from \$30 to \$31 at the furnace. While this buying revived activity in last half business, a sustained interest in iron for that period has not yet made its appearance. Not all of the sellers are urging upon their consumers purchases for that delivery at this time. Recent reports of sales of charcoal iron show that stocks at the furnaces have been considerably reduced, and at least one large interest is now dependent on its make to cover its sales. The offering of a lot of high silicon Southern iron has resulted in the prompt taking of a total approximating 2000 tons. The attitude of Southern furnaces as a whole is somewhat indefinite as to price, the endeavor on the part of some to advance their quotations being offset by the none too firm quoting of the \$23 price by others. Railroad transportation is something of a factor in the Southern situation, and iron in transit is commanding a premium. For Lake Superior charcoal iron we quote delivery prices at Chicago to include a freight rate of \$1.75. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5,	\$31.75 to \$32.75
Lake Superior charcoal, No. 1,	32.25 to 33.25
Lake Superior charcoal, No. 6 and Scotch	32.75 to 33.75
Northern coke foundry, No. 1,	31.00 to 32.00
Northern coke foundry, No. 2,	30.00 to 31.00
Northern coke foundry, No. 3,	29.50 to 30.50
Northern high phosphorus foundry,	27.00 to 28.00
Southern coke No. 1 f'dry and 1 soft,	27.50 to 28.50
Southern coke No. 2 f'dry and 2 soft,	27.00 to 27.50
Malleable Bessemer,	31.00 to 32.00
Basic,	31.00
Low phosphorus,	50.00 to 55.00
Silvery, 8 per cent,	38.50 to 39.00
Bessemer ferrosilicon, 10 per cent,	46.50 to 47.00

Rails and Track Supplies.—The few rail orders of the week involved no large quantities and included some interurban tonnage. An increase in demand for light rails is reported. Prices for track bolts have been advanced and the minimum quotation is now 4.50c. at the mill. Quotations are as follows: Standard railroad spikes, 3.50c. to 3.60c., base; track bolts with square nuts, 4.50c. to 4.60c., base, all in carloads, Chicago; tie-plates, \$55 to \$60, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base; open-hearth, \$40; light rails, 25 to 45 lb., \$44; 16 to 20 lb., \$45; 12 lb., \$46; 8 lb., \$47; angle bars, 2.25c.

Structural Material.—The price of structural steel from mill has been advanced \$3 per ton. Those of the mills that have not yet opened their books for last half contracts are being asked to make reservations for their trade for that period, while some of the fabricators are also seeking protection for the first half, and some of the mills are taking contracts for that delivery. Fabricators last week took few contracts of importance, the largest reported being one of 800 tons awarded to the Omaha Structural Steel Company for a Colorado sugar factory. Other lettings total about 850 tons. We quote for Chicago delivery of structural steel from mill 3.439c. to 3.689c.

We quote for Chicago delivery of structural steel out of jobbers' stocks, 3.85c.

Plates.—The principal business in plates last week, of a local nature, was the placing of 1500 tons by John Mohr & Sons for the new blast furnace of the Iroquois Iron Company. The price paid approximated 5c., Pittsburgh, the plates running up to about 75 in. in width, and deliveries beginning in the second quarter. A Pennsylvania mill took the business. General inquiry for plates continues insistent and voluminous. Prices have been advanced to a minimum of 3.75c., Pittsburgh. We quote for Chicago delivery of plates from mill, at its convenience, 3.939c.; for prompt shipment, in widths up to 72 in., 4.689c. to 5.189c., and for wide plates, 4.939c. to 6.25c., depending upon deliveries.

We quote for Chicago delivery of plates out of jobbers' stocks, 4.50c.

Sheets.—The easing-off in prices asked by those mills able to make early shipment of sheets has extended from galvanized to black sheets and prompt shipment can now be had at quotations \$5 per ton lower than had been asked. We quote, for Chicago delivery, No. 10 blue annealed, 4c. to 4.50c.; box annealed, No. 16 and lighter, 4.50c. to 5c.; No. 28 galvanized, 6.50c. to 7c. These quotations are minimum prices for contracts. Early shipment quotations are \$5 to \$10 per ton higher.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 4.80c.; No. 28 black, 5.15c.; No. 28 galvanized, 7.25c.

Bars.—The price of mild steel bars did not participate in the advance announced for plates and shapes and remains on the basis of 3c. at Pittsburgh. Inquiry continues, but the difficulties of securing this steel are not in any measure relieved. For iron bars and high carbon steel, conditions are unchanged, the mills taking on a limited amount of business in small quantities. We quote mill shipment, Chicago, as follows: Bar iron, 3c. to 3.25c.; soft steel bars, 3.189c. to 3.439c.; hard steel bars, 3c. to 3.25c.; shafting, in carloads, 20 per cent off; less than carloads, 15 per cent off.

We now quote store prices for Chicago delivery as follows: Soft steel bars, 3.75c.; bar iron, 3.75c.; reinforcing bars, 3.75c., base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent.

Rivets and Bolts.—Bolt makers are feeling the shortage of fuel and against the steady pressure of demand are handicapped by the problem of maintaining production at a maximum. Specifications while still above normal in January, have fallen somewhat below the exceptional rate of December. Variations in price, while still present in a degree, are less a factor than ever before. We quote as follows: Carriage bolts up to $\frac{1}{2}$ x 6 in., rolled thread, 40-10; cut thread, 40-2½; larger sizes, 30-5; machine bolts up to $\frac{1}{2}$ x 4 in., rolled thread, with hot pressed square nuts, 50; cut thread, 40-10; large size, 35-5; gimlet-point coach screws, 50; hot pressed nuts, square, \$2.50 off per 100 lb.; hexagon, \$2.60 off. Structural rivets, $\frac{1}{4}$ to $\frac{1}{2}$ in., 4.15c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 4.50c.; boiler rivets, 4.60c.; machine bolts up to $\frac{1}{2}$ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to $\frac{1}{2}$ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, \$3, and hexagon, \$3 off per 100 lb.; lag screws, 50.

Wire Products.—Trade in wire is without special incident and prices are unchanged. We quote as follows:

per 100 lb.: Plain wire, Nos. 6 to 9, base, \$3.239; wire nails, \$3.189; painted barb wire, \$3.339; galvanized barb wire, \$4.039; polished staples, \$3.339; galvanized staples, \$4.039, all Chicago.

Cast-Iron Pipe.—At Minneapolis, Minn., inquiry has been sent out for a maximum of 2200 tons of pipe and at Chicago bids have been received for 300 tons of special fittings. We quote as follows, per net ton, Chicago: Water pipe, 4-in., \$44.50; 6-in. and larger, \$41.50, with \$1 extra for class A water pipe and gas pipe.

Old Material.—The scrap market continues apathetic and uncertain. While the buying of scrap involves large quantities commensurate with the heavy production of the mills, the latter still appear able to satisfy themselves with absorbing what is offered from day to day and without entering the market for conspicuous tonnages. Prices secured by the railroads for scrap sold last week indicate few changes in values from the quotations last published. New offerings of railroad scrap aggregate about 10,000 tons, including 3200 tons from the Rock Island, 3000 from the Chicago & Northwestern, 2500 from the Santa Fe, 600 from the Michigan Central and 300 tons from the Monon. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	\$27.00 to \$28.00
Relaying rails	30.00 to 31.00
Old carwheels	18.50 to 19.50
Old steel rails, rerolling	27.00 to 28.00
Old steel rails, less than 3 ft.	24.50 to 25.00
Heavy melting steel scrap	21.00 to 22.00
Frogs, switches and guards, cut apart	21.50 to 22.00
Shoveling steel	18.25 to 18.75
Steel axle turnings	13.50 to 14.00

Per Net Ton

Iron angles and splice bars	\$26.50 to \$27.00
Iron arch bars and transoms	27.00 to 27.50
Steel angle bars	20.50 to 21.00
Iron car axles	34.00 to 35.00
Steel car axles	34.00 to 35.00
No. 1 railroad wrought	23.50 to 24.00
No. 2 railroad wrought	22.50 to 23.00
Cut forge	22.00 to 22.50
Pipes and flues	14.50 to 15.00
No. 1 busheling	17.00 to 17.50
No. 2 busheling	12.75 to 13.25
Steel knuckles and couplers	22.50 to 23.00
Steel springs	23.50 to 24.00
No. 1 boilers, cut to sheets and rings	13.50 to 14.00
Boiler punchings	18.50 to 19.00
Locomotive tires, smooth	31.00 to 31.50
Machine-shop turnings	9.25 to 9.75
Cast borings	9.00 to 9.50
No. 1 cast scrap	15.50 to 16.50
Stove plate and light cast scrap	11.50 to 12.00
Grate bars	13.00 to 13.50
Brake shoes	13.00 to 13.50
Railroad malleable	17.50 to 18.00
Agricultural malleable	14.75 to 15.25

Philadelphia

PHILADELPHIA, PA., Jan. 30, 1917.

Specifications for plates have become more numerous and heavier, with the shipyards and railroads still leading in buying. In other forms of steel products the demand is exceedingly good, though not quite so heavy as for plates. Structural shapes, however, are rapidly becoming as difficult to procure as plates. Orders for much ship and boiler steel have been refused. Mill operations appear to be at their maximum, a plate mill and a sheet mill both reporting that they are operating at 100 per cent of capacity. The Pennsylvania Railroad will expend \$20,000,000 in 1917 on its lines east of Pittsburgh, its purchases to include 225 locomotives, 2100 freight cars and 92 steel passenger cars, involving many thousand tons of steel. The pig-iron market has been a little more active in spot transactions, but as a whole it is quiet, with prices remaining firm. Both ferromanganese and ferrosilicon are higher, the latter being almost unobtainable. There has been more action in old materials, some of it at the expense of prices.

Pig Iron.—Quiet continues the principal characteristic of the market, although improvement is shown in the demand for small prompt lots. As said heretofore, consumers are well covered for the first half, and they are striving to get deliveries against what they have bought. Their interest in the second half has not been

stirred to activity. The furnace prices for eastern Pennsylvania No. 2 X range from \$30 to \$32, which means that the minimum delivered quotations are close to \$32. The quotations for Virginia iron also show considerable variance. One producer which has quoted Virginia No. 2 X as low as \$26, furnace, for last half delivery, is now asking \$27, furnace, or \$29.75, delivered. Another Virginia maker also quotes on the basis of \$27, furnace, forward delivery. For early shipment one maker asks \$28, furnace, or \$30.75, Philadelphia, and \$29, furnace, for last half, this interest not being willing to sell too heavily into the future. A lot of 500 tons of prompt Virginia iron was taken at \$28, furnace, and another lot, also 500 tons, at \$28.70, furnace. A furnace which is selling only for the last half, and which quotes \$27.75, furnace, or \$30.50, Philadelphia, has booked orders for about 5000 tons in the past two weeks. No activity in basic is reported. Standard low phosphorus continues strong at \$55 to \$57, delivered, and the supply is not equal to the demand which comes from domestic consumers, and those in Europe and Canada. Quotations for standard brands delivered in buyers' yards, prompt shipment, range about as follows:

Eastern Pa. No. 2 X foundry	\$30.50 to \$31.50
Eastern Pa. No. 2 plain	30.00 to 31.00
Virginia No. 2 X foundry	30.50 to 31.50
Virginia No. 2 plain	30.00 to 31.00
Gray forge	28.75 to 29.25
Basic	30.00
Standard low phosphorus	55.00 to 57.00

Iron Ore.—The only importation of the week ended Jan. 27 consisted of 8678 tons from Spain.

Ferroalloys.—Domestic 80 per cent ferromanganese, fairly prompt delivery, is quoted at \$180 to \$185, furnace, with foreign material at \$164, seaboard, but with none of the latter available in the first quarter. Inquiry, though steady, is not large, and is almost entirely for nearby delivery. Fifty per cent ferrosilicon is practically unobtainable, and for small lots up to \$200, Pittsburgh, is quoted. Blast-furnace ferrosilicon (11 per cent) is around \$43, furnace, or \$46.44, Philadelphia. Speigeleisen continues to grow in strength, sales having been made at \$63.50 and \$64.50 delivered at Pennsylvania points, with \$65 now asked.

Plates.—A lot of 1000 to 1200 tons of ship plates for last half delivery has been taken at 6c., Pittsburgh. The material is for delivery to a domestic yard, but is to enter a foreign ship. The general quotation for ship plates is 6.159c., Philadelphia. Tank plates range from 4.909c. to 5.159c., Philadelphia. Marine boiler steel has been sold at 12.40c., mill, to which must be added freight to the Pacific coast. An inquiry calls for several thousand tons of special plates to be used in the manufacture of hand grenades. Specifications were more numerous and heavier than in the preceding week, and inability to make shipments caused one mill to refuse several thousand tons of boat and boiler steel, despite the fact that its production has been worked up to 100 per cent. It has booked tonnage for shipment in the first and second quarters of 1918. Export offers include substantial tonnages for Japan, Italy and Norway. Four freight steamers have been placed with yards on the Atlantic seaboard, and at least six boats are pending. Deliveries of universal plates are now on practically the same basis as sheared plates.

Structural Material.—Prompt shipment shapes are almost as difficult to procure as plates. Quotations are unchanged, ranging from 3.659c. to 3.909c., Philadelphia. Ship shapes remain at 4.159c., Philadelphia. The American Bridge Company was low bidder on the runway to be erected at the League Island Navy Yard, which will require 5000 tons. It is now understood that the big job for the Westinghouse Electric & Mfg. Company, at Essington, Pa., which will require 7500 tons, will be divided between Lewis F. Shoemaker & Co. and the McClintic-Marshall Company, the former supplying 3000 tons and the latter 4500 tons. A building for the Pathological Hospital, Philadelphia, will require about 250 tons. Morris, Wheeler & Co. are reported to have been awarded a building for the Bell Telephone Company, Germantown, Pa., calling for

about 200 tons, and also an addition to the plant of the Link-Belt Company, Nicetown, Pa., about 400 tons.

Billets.—Quotations are unchanged at \$60 to \$65, mill, for soft open-hearth rerolling billets, and \$75 to \$85 for forging billets.

Bars.—The nominal quotation for steel bars is unchanged at 3.409c., Philadelphia, with miscellaneous business taken at 3.659c. Ship bars are quoted at 4.159c., Philadelphia, likewise bars which must conform to Lloyd's specifications. Iron bars are strong at 3.159c., Philadelphia, carload lots.

Sheets.—No. 10 blue annealed sheets are quoted from 4.659c. to 4.909c., Philadelphia. Makers in this territory are pleased over their rate of production, having attained 100 per cent. In the case of some material for export, delay has been occasioned by the fact that Canadian buyers have asked that the steel conform to certain specifications.

Coke.—Little or no change is noted as compared with a week ago. Prices actually paid vary from day to day. Spot furnace is quoted at \$8.50 to \$9 per net ton at oven, and contract at \$6 to \$8.50. Spot foundry ranges from \$10 to \$11, and contract over the first half \$8 to \$8.50. Freight rates from the principal producing districts are as follows: Connellsburg, \$2.05; Latrobe, \$1.85, and Mountain, \$1.65.

Old Material.—The market has been a little more active, but some of the business has been at the expense of prices. Between 2000 and 3000 tons of borings and turnings have been taken by a steel mill at \$12.50. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are as follows:

No. 1 heavy melting steel	\$20.50 to \$21.50
Old steel rails, rerolling	30.00 to 31.00
Low phos. heavy melting steel scrap	33.00 to 36.00
Old iron and steel axles (for export)	43.00 to 45.00
Old iron rails	28.00 to 29.00
Old carwheels	20.50 to 21.00
No. 1 railroad wrought	26.00 to 27.00
Wrought-iron pipe	17.00 to 18.00
No. 1 forge fire	15.00 to 16.00
Bundled sheets	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Machine-shop turnings	12.50 to 13.00
Cast borings	13.50 to 14.00
No. 1 cast	20.00 to 21.00
Grate bars, railroad	15.50 to 16.00
Stove plate	16.50 to 17.00
Railroad malleable	17.50 to 18.00

Cleveland

CLEVELAND, OHIO, Jan. 30, 1917.

Iron Ore.—Vessel contracts have been closed in the past few days for carrying about 500,000 tons of iron ore from the head of the Lakes at the going rate of \$1 per ton free. Most of the fleets have about all of the ore tonnage they can handle, and it is not expected that many more season contracts will be made. It was reported that some small shippers have offered \$1.25 per ton for carrying their ore. No ore sales are reported. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; Mesaba Bessemer, \$5.70; old range non-Bessemer, \$5.20; Mesaba non-Bessemer, \$5.05.

Pig Iron.—Because of unsatisfactory operating conditions, due to the scarcity of coal and coke, blast furnaces are unable to keep up on shipments, and there is some demand for prompt shipment coming from foundrymen unable to get iron as fast as needed from their regular source of supply. Some producers feel that unless conditions improve there will be a shortage in foundry grades. The demand for last half contracts is light. A Cleveland interest has advanced its Valley price on foundry iron to \$35 for No. 2 for the last half, and has quoted \$36.50 for prompt shipment. It is doubtful if \$32 would now be shaded by Valley furnaces. A stove interest has purchased 1000 tons of Ironton iron—300 tons for the second quarter and 700 tons for the last half—for its Bedford, Ohio, and Indianapolis plants. The price of \$30 at furnace, or \$31.60, delivered Bedford, is lower than it could be purchased from nearby Cleveland furnaces. The same interest has also purchased 1000 tons of Southern silvery iron. There is

some demand for Southern iron for prompt shipment and last half. We note the sale of 900 tons of high phosphorus Tennessee iron in three lots for delivery in Toronto, Ontario, in the last half at \$22.50 at furnace, or \$27.05 delivered. A northern Ohio sanitary company is in the market for 500 tons of No. 1 Southern for the last half. Tennessee silvery iron is quoted at \$29, Birmingham, for 8 per cent. Virginia foundry iron is being quoted in this market at \$28 for No. 2 for spot shipment and first half. We quote, delivered Cleveland, as follows:

Bessemer	\$39.95
Basic	30.95
Northern No. 2 foundry	\$31.95 to 32.30
Southern No. 2 foundry	26.50 to 29.00
Gray forge	29.95
Ohio silvery, 8 per cent silicon	\$37.62 to 39.62
Standard low phos., Valley furnace	50.00 to 51.00

Coke.—Foundries are still having a hard time in getting coke as needed because of the car situation, and one or two local consumers have been helped out with small lots of by-product coke from a Cleveland plant. The output of by-product plants is being curtailed by the coal shortage, so that in most cases the blast furnaces need all the fuel these plants supply. There is some demand for spot foundry coke, and one consumer has an inquiry out for a last half contract. We quote standard Connellsburg foundry coke for prompt shipment at \$10.50 to \$11 per net ton at oven. Virginia foundry coke is quoted at \$11 at oven for prompt shipment.

Finished Iron and Steel.—With the car situation unimproved, causing a curtailment in both mill production and shipments, the delivery situation is much worse. New demand is rather light in most finished lines and specifications have fallen off somewhat. The policy of mills to take no orders subject to price revision or cancellation is apparently having the effect of curtailing contracting. Plates continue in good demand. Three inquiries, aggregating 5800 tons, are pending for plates for tank cars. The local plate market is firm at 5c., Pittsburgh. In structural lines the only contract reported is for 2500 tons for the union passenger station in Indianapolis, taken by the Mount Vernon Bridge Company, Mount Vernon, Ohio. Hoops are in good demand, but are fully as scarce as any other steel product. An Ohio locomotive shop is inquiring for 1000 tons of forging billets for the last half. The demand for hard steel bars continues fairly active and quotations are unchanged at 3c. to 3.25c. at mill. The demand for sheets is quite heavy, and some of the mills that recently had considerable tonnage to sell are now well filled. Prices are firm. We quote sheets at 4.50c. to 5.50c., Ohio mill, for No. 28 black; 4.25c. to 5c. for No. 10 blue annealed, and 6.50c. to 7.50c. for No. 28 galvanized. We quote bar iron at 3c. to 3.10c., Cleveland. Warehouse prices are 3.25c. for steel bars under 2 in., 3.95c. for structural material, 4.60c. for plates, 4.75c. for hoops, 5c. for black sheets and 3.75c. for blue annealed sheets.

Bolts, Nuts and Rivets.—The demand for bolts and nuts has improved, now that the inventory season is over. There is a heavy demand for cold punched hexagon nuts, and these are very scarce, due partly to the fact that the mills are having great difficulty in getting stock for their manufacture. Prices are firm. Rivet specifications are coming out in good volume and some new contracts for delivery over the remainder of the first half at regular prices are reported. There is also some inquiry from shipyards. Prices, which have not changed for some time, are 4.25c., Pittsburgh, for structural rivets and 4.35c. for boiler rivets. Bolt and nut discounts are as follows:

Common carriage bolts, $\frac{1}{2}$ x 6 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40 and $2\frac{1}{2}$; larger or longer, 30 and 5. Machine bolts with h.p. nuts, $\frac{1}{2}$ x 4 in., smaller or shorter, rolled thread, 50; cut thread, 40 and 10; larger or longer, 35 and 5. Lag bolts, cone point, 50. Square and hexagon h.p. nuts, blank \$2.50 off the list; tapped, \$2.30 off. C.p.c. and t. hexagon nuts, all sizes, blank \$2.25 off; tapped, \$2.00 off. Cold pressed semi-finished hexagon nuts, 50, 10 and 5 off.

Old Material.—The market continues dull, but a firmer tone has developed. Dealers feel that prices will

not go lower but that the tendency will be upward, and they are not willing to sell much at present quotations. Mills are still well supplied and out of the market, but there is a moderate volume of business between dealers. Heavy melting steel has advanced about 50c. per ton in the Cleveland market, and dealers are now offering \$23. The demand for borings and turnings has improved, owing to the demand from blast furnaces. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	\$21.50 to \$22.00
Steel rails, rerolling	28.00 to 29.00
Steel rails under 3 ft.	27.00 to 27.50
Iron rails	28.00 to 28.50
Steel car axles	48.00 to 49.00
Heavy melting steel	22.50 to 23.00
Carwheels	20.00 to 20.50
Relaying rails, 50 lb. and over	37.00 to 38.00
Agricultural malleable	15.00 to 15.50
Railroad malleable	20.50 to 21.00
Steel axle turnings	16.50 to 17.00
Light bundled sheet scrap	14.50 to 15.00

Per Net Ton	
Iron car axles	\$44.00 to \$45.00
Cast borings	9.75 to 10.00
Iron and steel turnings and drillings	9.50 to 9.75
No. 1 busheling	18.00
No. 1 railroad wrought	24.00 to 25.00
No. 1 cast	17.75 to 18.25
Railroad grate bars	13.50 to 13.75
Stove plate	13.25 to 13.50

Cincinnati

CINCINNATI, OHIO, Jan. 31, 1917.—(By Wire.)

Pig Iron.—A sale of 3000 to 3500 tons of Ohio silvery iron was made to a Michigan melter for last half shipment. Quotations on 8 per cent silvery irons range from \$38 to \$40 at furnace, and very little can be obtained for shipment in the next four months. Northern foundry for nearby delivery is also scarce, but a few lots of off-grade iron have been picked up by different buyers, with all such sales based on \$30, Ironton, for No. 2, which is the same figure for last half. An Indiana consumer purchased 1500 tons of Northern foundry for last half, and other smaller contracts were made for the same delivery in Ohio and Michigan. Both Southern and Virginia irons are invading territory usually served by Northern furnaces. In Michigan two sales of Virginia No. 2X have been made for first quarter shipment and 1000 tons for first half. Southern producers are unable to take on much business for the first half, but there is some warrant iron on the market for that delivery. Southern furnace spot prices now occupy a unique position, with \$24 to \$25, Birmingham basis, quoted for nearby shipments, while some of the same iron can be bought \$1 per ton lower for last half shipment. Recent sales of Southern iron for forward delivery have been made in both the Cleveland and Buffalo districts. The inquiry is improving, but the majority of buyers are slower than usual in closing for full last half requirements. Malleable is scarce, with no inquiries out other than those previously reported that are still pending. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	\$26.40 to \$28.40
Southern coke, No. 2 f'dry and 2 soft.	25.90 to 27.90
Southern coke, No. 3 foundry	25.40 to 27.40
Southern coke, No. 4 foundry	24.90 to 25.40
Southern gray forge	24.40 to 26.40
Ohio silvery, 8 per cent silicon	39.26 to 41.26
Southern Ohio coke, No. 1	31.76
Southern Ohio coke, No. 2	31.26
Southern Ohio coke, No. 3	30.76
Southern Ohio malleable Bessemer	31.26
Basic, Northern	31.26
Lake Superior charcoal	30.20 to 31.20
Standard Southern carwheel	28.90 to 29.40

(By Mail)

Finished Material.—An advance is talked of on local warehouse prices to more nearly conform with those quoted by jobbers in other cities. No. 10 blue annealed sheets, quoted from stock to-day at 4.65c., are expected to take an advance of fully \$2 per ton before the week is past. Also plates are due to be marked up. Mill shipments are going forward at a better rate and deliveries from warehouse stocks have improved. The general tendency of the trade is to buy for only nearby requirements. We quote store prices as follows: Wire nails, \$3.40 to \$3.50 per keg base; barb wire, \$3.40 per

100 lb.; steel bars, 3.70c. to 3.80c.; round head rivets, 4.50c. to 4.60c. Mill quotations on No. 28 galvanized sheets range from 6.90c. to 7.15c., Cincinnati or Newport, Ky., and on black sheets from 5.15c. to 5.25c. There is a better demand for railroad track material. Screw machine products are hard to get for prompt shipment from the factories and jobbers' stocks are dwindling.

Coke.—Prices on both furnace and foundry coke for spot shipment are too irregular to establish a general rate. Business has been booked for prompt 48-hr. coke all the way from \$8.50 to \$12, and on 72-hr. from \$9 to \$13 per net ton at oven. There does not seem to be any difference in the Connellsville, Wise County and Pocahontas fields as far as spot market prices are concerned. Little new business has been done in either furnace or foundry coke for any shipment. The marking up of future shipment quotations to \$5.50 to \$7 on furnace coke and even higher in some cases, and from \$6.50 to \$8 on foundry coke has served to check buying. The car situation shows some improvement, but there is yet considerable uneasiness among foundrymen who have small yard stocks.

Old Material.—Both incoming and outgoing shipments are being moved by the railroads at a better pace. While the tendency among melters of all kinds of scrap is to take all due them on old contracts, as a rule, they are holding back in buying for requirements in the last half. All prices are firm and it is predicted by some dealers that advances may be looked for at an early date on various grades. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	\$14.00 to \$14.50
Old iron rails	24.25 to 24.75
Relaying rails, 50 lb. and up	27.75 to 28.25
Rerolling steel rails	24.25 to 24.75
Heavy melting steel scrap	20.25 to 20.75
Steel rails for melting	20.25 to 20.75

Per Net Ton	
No. 1 railroad wrought	\$21.00 to \$21.50
Cast borings	6.50 to 7.00
Steel turnings	6.50 to 7.00
Railroad cast	16.75 to 16.75
No. 1 machinery cast	17.50 to 18.00
Burnt scrap	9.75 to 10.25
Iron axles	32.50 to 33.00
Locomotive tires (smooth inside)	27.00 to 27.50
Pipes and flues	13.25 to 13.75
Malleable cast	14.75 to 15.25
Railroad tank and sheet	11.75 to 12.25

Buffalo

BUFFALO, N. Y., Jan. 30, 1917.

Pig Iron.—The demand for small lots for quick delivery has increased, and there now appears to be quite a steady flow of such inquiry. Only a limited tonnage has been placed, however, because most of the producers of the district have practically nothing to sell. All sales have been made at prices not less than \$35, furnace, which is the flat price for all grades. As a rule, immediate shipment commands \$35.50 or over. Resale iron has dwindled to almost insignificant proportions. The railroad situation, as regards shipments from furnaces, is about the same as a week ago, little progress having been made toward the amelioration of the demoralized conditions which have prevailed for several weeks. We quote as follows for local iron for first quarter and first half delivery, f.o.b. furnace, Buffalo:

High silicon irons	\$35.00 to \$35.50
No. 1 foundry	35.00 to 35.50
No. 2 X foundry	35.00 to 35.50
No. 2 plain	35.00 to 35.50
No. 3 foundry	35.00 to 35.50
Gray forge	35.00 to 35.50
Malleable	35.00 to 35.50
Basic	35.00 to 35.50
Bessemer	35.00 to 35.50
Charcoal, according to brand and analysis	35.50 to 36.00

Finished Iron and Steel.—Plates are especially strong. Some independent producers are asking 4 1/2c., Pittsburgh, for shipment at mill's convenience, and there is a demand remaining unsatisfied even at this price. A few second quarter contracts for bars, shapes and plates have been made during the week, covering needs of regular customers, so far as unfilled capacity

will allow. Some inquiry for steel sheet piling is before the market for immediate shipment. Hoops are in great demand, and it is exceedingly difficult to get mills to consider orders except from old customers. In structural material two important lettings in Toronto are announced, namely, the first unit of the new Eaton department store, approximating 13,000 tons, awarded to the Dominion Bridge Company (Bethlehem shapes to be used), and steel for the first unit of the Imperial Munitions Board electric steel plant, 2500 tons, awarded to the Hamilton Bridge Works. Figures are soon to be taken for structural steel for an additional unit of the Buffalo General Electric Company's power plant, on the Niagara River, requiring approximately 2500 tons.

Old Material.—No large transactions in any commodity are reported. Where the material required is obtainable, specialties are commanding somewhat stronger prices than shown by the regular lines, but with no quotable changes. Dealers' asking prices, per gross ton, f.o.b. Buffalo, are as follows:

Heavy melting steel	\$25.50 to \$26.50
Low phosphorus	32.00 to 36.00
No. 1 railroad wrought	30.00 to 31.00
No. 1 railroad and machinery cast	22.50 to 23.50
Iron axles	45.00
Steel axles	45.00
Carwheels	23.00 to 23.50
Railroad malleable	22.00 to 23.00
Machine shop turnings	11.00 to 11.50
Heavy axle turnings	16.00 to 16.50
Clean cast borings	11.00 to 11.50
Iron rails	25.00 to 26.00
Locomotive grate bars	15.00 to 15.50
Stove plate	14.00 to 14.50
Wrought pipe	16.00 to 16.50
No. 1 busheling scrap	20.50 to 21.50
No. 2 busheling scrap	13.00 to 13.50
Bundled sheet scrap	14.00 to 14.50

St. Louis

ST. LOUIS, Mo., Jan. 29, 1917.

Pig Iron.—The market shows signs of an early panicky advance. Consumers who have asserted that they were covered even through the last half are coming into the market with inquiries for delivery in the first half. Other developments indicate that this territory may find itself with no supplies of pig iron. This relates to Southern foundry iron as well as basic. Predictions are being made of a severe shortage, and a possibility of even \$40, Birmingham, is mentioned. Inquiries include one for 2500 tons of No. 2 Southern, and a considerable number ranging from 1000 tons to carload lots. Sales during the week included 1000 tons of No. 2 Southern, 1000 tons of No. 2 Northern, 300 tons of No. 2 Northern, 100 tons of Virginia iron and a considerable number of small lots which went at retail prices.

Coke.—Coke is in the same nervous condition which has characterized the market for some weeks. Twelve dollars per ton, Connellsville, for best selected 72-hr. foundry coke is the lowest noted, while some small sales have been at higher figures. By-product coke is not figuring in the market at all at present.

Finished Iron and Steel.—Specifications on contracts are being strongly urged. No contracts are being entered into and no delivery dates are being made by mill representatives for structural material, bars or plates, which are quoted stiffly at \$3.25 for structural and \$3.75 for plates, Pittsburgh, with no assurances as to delivery because of the car situation. Light rails are in good request. Angle bars are quoted at \$4.50, the highest figure ever made in this territory. Two small inquiries for standard rails have appeared, each for about 25 miles of 75-lb. material, with fastenings, both from Southwestern roads. Movement out of warehouse continues very free at the following prices: Soft steel bars, 3.80c.; iron bars, 3.70c. to 3.75c.; structural material, 3.90c.; tank plates, 4.55c.; No. 10 blue annealed sheets, 4.85c.; No. 28 galvanized sheets, black sheet gage, 7.50c.; No. 28 black sheets, cold rolled, one pass, 5.30c.

Old Material.—There is some evidence of increasing strength in rolling mill and foundry grades, while the market as a whole has a better tone. Railroads are unable to handle material either into or out of dealers' yards, nor are they picking up their scrap material,

having no cars to move it, and so there is practically nothing coming into the market. No lists came out during the week, but the first of the month usually develops some offerings. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$26.00 to \$26.50
Old steel rails, rerolling	26.00 to 26.50
Old steel rails, less than 3 ft	27.00 to 27.50
Relaying rails, standard section, subject to inspection	33.00 to 34.00
Old carwheels	18.50 to 19.00
scrap	22.00 to 22.50
Heavy shoveling steel	19.00 to 19.50
Ordinary shoveling steel	17.50 to 18.00
Frogs, switches and guards cut apart	22.00 to 22.50
Bundled sheet scrap	13.50 to 14.00

Per Net Ton	
Iron angle bars	\$26.00 to \$26.50
Steel angle bars	21.00 to 21.50
Iron car axles	34.00 to 35.00
Steel car axles	34.00 to 35.00
Wrought arch bars and transoms	27.50 to 28.00
No. 1 railroad wrought	23.00 to 23.50
No. 2 railroad wrought	21.50 to 22.00
Railroad springs	22.50 to 23.00
Steel couplers and knuckles	23.50 to 24.00
Locomotive tires, 42 in. and over, smooth inside	29.00 to 30.00
No. 1 dealers' forge	17.50 to 18.00
Cast iron borings	8.50 to 9.00
No. 1 busheling	15.50 to 16.00
No. 1 boilers, cut to sheets and rings	13.00 to 13.50
No. 1 railroad cast scrap	14.00 to 14.50
Stove plate and light cast scrap	10.00 to 10.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	13.50 to 14.00
Pipes and flues	14.00 to 14.50
Heavy railroad sheet and tank scrap	13.50 to 14.00
Railroad grate bars	11.50 to 12.00
Machine shop turnings	9.00 to 9.50
Heavy axle and tire turnings	12.50 to 13.00

Birmingham

BIRMINGHAM, ALA., Jan. 29, 1917.

Pig Iron.—January, which has been a quiet month, goes out with pig iron somewhat less strong than when the new year opened. The quotation of \$23 for last half is more general; in fact, quotations of higher prices would hardly lead to transactions. The leading interest made several second half sales one day in the past week uniformly at \$23, and it is understood, in the case of especially desirable business, that this price would be shaded. Warrants have been sold at \$22.50, and offers at \$22 are mentioned by parties deemed reliable. Warrant iron at \$22 ought to figure as the equivalent of furnace iron at \$23, owing to yard charges, commissions, etc. However, the warrant iron has affected the market and the price level was, in consequence, shaken to something like \$1 below the quotations of early January. A sale of 800 tons for a Scandinavian country was made at \$25, but the same seller booked carload lots for immediate domestic delivery at \$24. Some carload lots were sold at \$25, but the average of spot business of any size is done at \$24, with a tendency to shade that for second quarter on desirable business. The export inquiry has been quite heavy, and there will be additional bookings if ship room is obtainable. Of this there is much doubt, as the export iron already ordered and made finds difficulty in getting moved. One of the best-posted iron men in the South is of the opinion that the metal market has commenced to readjust itself and that somewhat lower levels are to be expected. The spot market is scarcely to be regarded, because there is so little spot to be had, and consumers are so well taken care of for the first half. It is the second half which counts now. We quote, per gross ton, for early delivery, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	\$23.50 to \$25.50
No. 2 foundry and soft	23.00 to 25.00
No. 3 foundry	22.50 to 24.50
No. 4 foundry	22.25 to 24.25
Gray forge	22.00 to 24.00
Basic	23.50 to 25.00
Charcoal	25.00 to 26.00

Cast-Iron Pipe.—Leading makers admit receiving intimations that parties contemplating large transactions prefer to wait until lower prices prevail before they place orders. This has been feared for some time. Notices of delay are now coming in from communities where the bonds voted are not sufficient for the in-

tended improvement under present prices. Production will probably be reduced in the near future. For the present prices will be maintained, as pig iron is not the only raw material used in pipe manufacture which is now dear. We quote, per net ton, f.o.b. Birmingham district yards, as follows: 4-in., \$39; 6-in. and upward, \$36, with \$1 added for gas pipe and extra lengths.

Coal and Coke.—As high as \$6 per net ton has been paid for domestic coal in Birmingham itself. Steam coal is quite active at the higher levels. Coke is still scarcer. Contract beehive coke to old customers brings \$7.50 per net ton at oven. Spot coke is quoted at \$10.50 and \$11, with very little to be had at any figure. Furnace coke, where obtainable, is worth \$4.50.

Old Material.—The scrap market is weak, the embargoes helping to maintain its weakness. No apparent effort is being made to buy or to sell. Prices remain unchanged. We quote, per gross ton, f.o.b. Birmingham dealers' yards, as follows:

Old steel axles	\$32.00 to \$35.00
Old steel rails	18.00 to 18.50
No. 1 wrought	18.00 to 18.50
Heavy melting steel	15.50 to 16.00
No. 1 machinery	17.00 to 17.25
Carwheels	14.00 to 14.50
Tram carwheels	12.50 to 13.00
Stove plate and light	12.50 to 13.00

San Francisco

SAN FRANCISCO, CAL., Jan. 23, 1917.

Much complaint is heard of slow delivery of material en route from the mills, owing to railroad congestion, which is retarding considerable construction work. The jobbing movement in most lines of finished products is more active than usual at this season, and merchants are specifying freely on contracts. New inquiries from large consumers also are numerous, but the tonnage closed is limited by the crowded condition of the mills.

Bars.—Inquiries for reinforcing bars are increasing in number, and many large projects are expected in the market as soon as the rains are over. The tonnage moved in a jobbing way is large, as many important consumers are buying from store; specifications are above normal. Export demand keeps up well, but no great volume of this business is being placed locally. The first half output of local mills is fairly well booked, with some business running into the second half. Local jobbing prices are 4.35c. for small bars, or 4.85c. for large sizes brought from the East.

Structural Material.—Contracts are coming out a little more freely, despite the effect of high prices and slow deliveries. The California Steel Company has a 300-ton contract for the Oahu Sugar Company, Honolulu, a contract for a two-story addition to the Magnin Building, this city; and a 75-ton job for the H. G. Prince cannery, Oakland. Dyer Brothers have taken a 200-ton job for the Natomas Consolidated, and a good-sized job for the Pacific Coast Borax Company. Figures are being taken for 700 tons for a bank building at California and Montgomery streets, and it is announced that some smaller structures will soon be ready for figuring. Inquiries are out for a lot of bridges of various sizes in Oregon, Washington and Idaho. Bids were rejected for a bridge over the Spokane River near Spokane, Wash.

Plates.—The Union Iron Works launched two large steel ships last week. Shipbuilding operations at many yards have been held up badly by the slow delivery of steel, and jobbing stocks are being drawn on as much as possible to meet the shortage, as well as for repair work. The smaller shops also are actively in the market. Nothing of great importance has appeared in the tank and pipe department, but manufacturers are specifying freely for work in hand. Tank plates from store are quoted at 5.50c.

Sheets.—There is some movement of corrugated galvanized for urgent requirements in the way of industrial buildings; though a considerable tonnage of painted corrugated sheets is being used. Flat galvanized sheets are rather quiet. Blue annealed are in strong demand, with an active jobbing business and

considerable tonnage offering to the mills, but few sellers willing to take new business. Galvanized sheets in small lots from store are quoted at 8.34c.

Wrought Pipe.—January tonnage has been rather above expectations in merchant sizes. This is attributed to the replenishing of stocks following inventory, though current jobbing sales are of very good volume, and requirements seem to be increasing. The oil-field trade keeps up in good shape, and the oil situation is encouraging.

Cast-Iron Pipe.—Some small hand-to-mouth corporation buying is reported, but no municipal business has been booked lately and there is little in immediate prospect. There has been talk of selling part of the 3000 tons of high-pressure pipe still in the San Francisco municipal yard. Prices stand as before, being \$49 per net ton for 6-in., \$52 for 4-in., and \$1 extra for class A and gas pipe.

Pig Iron.—Many of the large buyers have contracted for their year's requirements, but a considerable number are still holding off, or have bought rather lightly, and there is a fairly general disposition toward caution, though some new contracts are being placed for third and fourth quarters. Buying for early shipment is comparatively active, requirements being large. No. 1 foundry iron, San Francisco, is still quoted at about \$36 per gross ton for direct shipment.

Coke.—The market continues unsettled, with prices inclined to advance. Buying is spasmodic, with occasional good-sized orders. Values are uncertain, quotations ranging all the way from \$20 to \$22 per net ton.

Ferroalloys.—Ferrosilicon is quoted locally at about \$150 per ton. The supply has thus far been adequate, but is now running short, and will be insufficient for current needs unless shipments en route arrive very shortly. The Noble Electric Steel Company is now shipping ferrochrome east in carload lots.

Old Material.—Cast-iron scrap continues firm, with a strong demand and all available supplies closely held. Values are now ranging between \$20 and \$23 per net ton, with little of any kind to be had below those figures. Steel melting scrap is also strong at the old range of \$11 to \$15 per gross ton. Some large lots have lately been picked up by dealers in the mining districts.

New York

NEW YORK, Jan. 31, 1917.

Pig Iron.—Apart from a New England inquiry for 2500 tons of foundry iron for the last half, there is little of moment in that part of the market. Sales of 100 to 200 ton lots are made daily at full prices for early delivery, running from \$30 to \$31 at eastern Pennsylvania furnace. Foundries are getting iron as fast as they need it, though furnace men are much put to it to get their usual output, coke conditions getting worse with some of them. Where contracts exist for coke at \$4 at ovens and the furnace in order to keep running pays \$9 for coke in the spot market, there is by no means the profit the pig iron men have been credited with making of late. Virginia iron is sold at \$26.50 to \$28 at furnace for No. 2 for early delivery. One eastern Pennsylvania furnace recently withdrew from the market. So far as foundry iron goes, the export market is being largely made by Southern resale iron. The latest inquiry from Italy is for 6000 tons of standard Bessemer and 4000 tons of low phosphorus. The New York buyers for the Allies have picked up what Bessemer iron they could get at \$35 at Baltimore, but it has not been much in comparison with what is wanted. Under present coke conditions few furnaces are willing to go below \$35 at furnace. Some Southern warrant iron which had been held up at seaboard has been offered as low as \$20.50, Birmingham. Buffalo furnaces are doing very little in new business, but shipments are going out freely on their contracts, though there are occasional coke troubles. We quote at tidewater for early delivery: No. 1 foundry, \$31 to \$32; No. 2 X, \$30.50 to \$31.50; No. 2 plain, \$29.50 to \$30; Southern iron at tidewater, \$31 for No. 1 and \$29 to \$30 for No. 2 foundry and No. 2 soft.

Ferroalloys.—The ferromanganese market shows an advancing tendency and as high as \$200, delivered, has been asked the past week, as compared with \$185 a week ago. While \$164, seaboard, still stands as the quotation for the British alloy, one representative has been requested to be cautious as to sales for the third quarter and a higher price is not unlooked for. Very few inquiries are reported, but there have been sales of from 500 to 1000 tons of domestic alloy at \$175, delivered. Receipts from abroad are better than in December, when they were only 4401 gross tons, a low month for the year. Spiegeleisen, 20 per cent, is strong and active, and sales of several 1000 tons have been made at \$60 to \$65, furnace. Ferrosilicon, 50 per cent, is still very scarce, and buyers needing it urgently are paying from \$140 to \$200 per ton, delivered. Ferrotungsten is quoted at \$2.30 to \$2.50 per pound of contained tungsten, New York, with the ore concentrates selling at about \$16 to \$17 per unit. Ferrovanadium is quoted at \$2.75 to \$3.00, Pittsburgh, per pound of contained vanadium. Ferrocarbon-titanium is selling at 8c. per pound in carload lots, 10c. per pound in ton lots and 12½c. per pound in lots less than a ton. Ferrochrome, 60 to 70 per cent, is unchanged at 16c. to 20c., New York, per pound of contained chromium.

Structural Material.—Contracting goes on apace still largely for industrial plants and for railroad bridge work. Locally building work has not looked up, showing still the deterrent effect of high prices, which in other fields are subordinated to urgency or expediency of projects. One of the largest awards covers about 10,000 tons for the Eaton warehouse, Toronto, to be erected by the Dominion Bridge Works, though the steel will undoubtedly be furnished by the United States. Other closures include 500 tons for the William Beckers Aniline Chemical Company, Brooklyn, to Milliken Brothers, Inc.; 700 tons for the Keith Theater, Syracuse, to the Harris, Silvers, Baker Company; 250 tons for Pennsylvania Railroad bridge work, to the American Bridge Company; 600 tons for a Y. M. C. A. building, Worcester, to the Eastern Bridge & Structural Company, and 435 tons for the Link-Belt Company, Philadelphia, to Morris Wheeler & Co. In addition to 2000 tons at Schenectady for the General Electric Company, the McClintic-Marshall Company will supply 1000 tons for that company at Erie, Pa., and the McClintic-Marshall Company will supply close to 5000 tons for the Westinghouse plant at Essington, and Lewis F. Shoemaker & Co., about 3000 tons. It is understood that the American Bridge Company will supply 5000 tons for a crane runway for the League Island Navy Yard, Philadelphia. Among new projects may be mentioned 2700 tons for six wireless towers at Sayville, L. I., for the Atlantic Communication Company; 1000 tons for the Pierce-Arrow plant at Long Island City; 250 tons for a boiler house for Tidewater Oil Company, Bayonne, N. J., and 500 tons for a doctor's building in New York. The railroads continue to come in the market for small bridges, and among these may be mentioned 400 tons for the Lehigh Valley, 275 tons for the Boston & Maine, 250 tons for the Buffalo, Rochester & Pittsburgh, and several hundred tons for the Pennsylvania. While the Carnegie Steel Company is now asking 3.25c., Pittsburgh, with a limited tonnage available late this year, plain shapes can still be obtained in lots attractive from the mill standpoint at the same price in three to five months' shipment. Small lots are higher, depending on the requirements as to delivery. We quote mill shipments of shapes in two to five months at 3.419c. to 3.919c. New York, and late this year and in early 1918, 3.419c. New York. Warehouse shipments are a minimum at 3.95c. New York.

Plates and Bars.—Some talk is heard of a slowing down of buying of ship material because of prices and the indefiniteness of delivery. Incidentally, little credence is given to the claim that England is sounding out the market for a large number of ships. Selling representatives are still considerably annoyed by duplication of inquiries with the indefiniteness of reliability which commonly surrounds such proffered business. One Japanese buyer, who wants 40,000 tons, is slow to close. It is still believed that tank plates may be obtained at 4.50c., Pittsburgh, in 10 to 12 weeks, but

some mills are firm at 4.75c. for ordinary tank and universal plate for such delivery, and others at 5c. A quotation of 4c. for ship shapes with 6c. for ship plates is still holding, particularly on export business. In bar business prices as high as 4.50c. are mentioned for small angles. In some recent war-steel closures, it appears that the steel is supplied under an English specification, though intended really to meet an Italian demand, British steel makers meeting the Italian specifications and demanding the American steel to make good the deficiency. An inquiry of 40,000 tons of 4½-in. rounds for export of 0.30 to 0.40 per cent carbon is noted, with 0.07 per cent allowance for sulphur and phosphorus, presumably intended for axles. There is some indication that American steel makers are stiffer in resistance to meeting close sulphur stipulations, so as not to curtail production any more than possible. We quote universal and ordinary tank plates at 4.669c. to 5.169c., New York, but ship plates at 5.169c. to 6.169c., and first-half 1918 plates at 3.919c., New York. Out of store we quote 4.75c., New York, for plates under 36 in. in width and 5c. on wider plates. We quote mill shipments of steel bars at 3.169c. to 3.669c., New York, the lower price for indefinite delivery and the higher for small quantities in, say, three months. We quote mill shipments of bar iron at 3.169c., New York. Out of warehouse iron bars are 3.70c., and steel bars are 3.85c., New York.

Cast-Iron Pipe.—New Brunswick, N. J., will open bids Feb. 6 on 194 tons of 6 and 8 in. Many projects are under consideration and are steadily being brought into practical shape, requiring large quantities of pipe, so that important business is assured for the early future. Specifications are not ready yet on any of these matters. Municipal lettings are few and small. The price of pipe is maintained on a basis of \$41.50 per net ton, tidewater, for carload lots of 6-in. class B and heavier, with class A and gas pipe taking an extra of \$1 per ton.

Old Material.—Transactions in heavy melting steel scrap are in moderate volume and some business is being done in certain classes of rolling-mill stock. Consumers generally are not disposed to buy, however, and railroad embargoes are still seriously interfering with deliveries. These embargoes are operating in favor of consumers who appreciate bargains, as occasional car-loads are necessarily diverted to other points than intended and sold at a concession to avoid the payment of return freight and other expenses. The export movement in heavy melting steel scrap continues active, with \$21.50 per gross ton, alongside vessel, the usual price paid on such business. Brokers quote buying prices as follows to local dealers and consumers, per gross ton, New York:

Heavy melting steel scrap for eastern Pennsylvania shipment	\$17.50 to \$18.00
Old steel rails (short lengths) or equivalent	18.50 to 19.00
Relaying rails	37.00 to 38.00
Rerolling rails	27.00 to 27.50
Iron and steel car axles (for export)	43.00 to 43.50
No. 1 railroad wrought	22.00 to 23.00
Wrought-iron track scrap	21.00 to 21.50
No. 1 yard wrought, long	19.00 to 19.50
Light iron (nominal)	4.50 to 5.00
Cast borings (clean)	10.50 to 11.00
Machine shop turnings	9.50 to 10.00
Mixed borings and turnings (nominal)	8.00 to 8.50
Wrought pipe (not galvanized or enameled)	15.00 to 15.50

Cast scrap is being freely offered and prices are easy. Foundries are buying to some extent, with a disposition among large consumers to take advantage of lots offered at concessions. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

No. 1 cast	\$18.50 to \$19.00
No. 2 cast	16.50 to 17.00
Stove plate	14.00 to 14.25
Locomotive grate bars	13.75 to 14.00
Old carwheels	20.00 to 20.50
Malleable cast (railroad)	18.00 to 18.50

The Huber Hand Stoker Company has removed its main office to Providence, R. I. A New York City office will be maintained at 21 Park Row.

British Steel Market

Pig-Iron Market Easier, but Tone Firm—Tin Plates Firm

LONDON, ENGLAND, Jan. 31, 1917.—(By Cable.)

The pig-iron market is generally easier but its tone is maintained. Tin plates are quoted at 27s. 6d. and for wire rods for spring shipment £28 10s. are asked, c.i.f. Liverpool. Other quotations are unchanged. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 27s. 6d.
Steel black sheets, No. 28, export, f.o.b. Liverpool, £19 5s.
Hematite pig iron, f.o.b. Tees, 142s. 6d.
Sheet bars (Welsh) delivered at works in Swansea Valley, 115 5s. nominal.
Ferromanganese, £34 to £36 and upward.
Ferrosilicon 50 per cent, c.i.f., £29 10s.

(By Mail)

Pig-Iron Output Larger—Tin-Plate Prices Cut—Demand for Ferromanganese

LONDON, ENGLAND, Jan. 16, 1917.—Full pressure of operations has reasserted itself since the beginning of the year, chiefly in connection with national requirements. As a result of recent efforts to develop the capacity of plants, especially pig iron, the position has improved considerably, although the questions of labor and railroad transportation are still a matter of concern. Special needs tend to absorb an increasingly large proportion of the productive capacity of the country.

There has been more business in pig iron lately, and makers on the Northeast Coast are not keen for bookings further ahead, since the bulk of this quarter's output is contracted for. There is a large demand as far ahead as midsummer and the idea is cherished of an advance in the maximum prices. There has been more life in hematite, some substantial forward business having gone through for the home trade and export, the prospective further increase in output permitting greater freedom of action. There is more regularity in the deliveries.

Conditions in semi-finished steel are such that manufacturers find much difficulty in covering their needs because of government requirements. The price of Welsh bars remains officially at £10 7s 6d, but steel works are complaining that this figure is unduly low compared with the high cost of production, and attempts are again being made to secure a revision. American material is exceedingly scarce, arrivals having dwindled to very small proportions, with no prospect of any increase. The price of billets is difficult to ascertain, but orders could hardly be placed at much below \$95, c.i.f. Liverpool, for January-June shipment, while a fair tonnage, including wire rods at high prices, continues to be diverted to Continental ports.

Last week's Birmingham quarterly meeting disclosed no features. The outlet for finished iron and steel is greater than ever, orders being sufficient to keep plants going full time into next spring. Prices are strongly held; sheet makers are greatly handicapped by the short supply of steel.

The recent cutting of prices in tin plates by leading works, who accepted the relatively low price of 25s 6d. f.o.b. net for 20 x 14 for government work, has unsettled the market. The demand has been checked and prices have weakened all round, though makers seem inclined to await developments. The difficulties surrounding the industry are greater than ever and export business is steadily declining through permit restrictions.

There is not much change in ferromanganese, the tendency being irregular, though generally firm. Higher prices (from £36 upward f.o.b.) have been paid for shipment in the next quarter to Italian and Spanish ports, producers having but little to sell except for more distant shipment, though second hand material is still available. Quotations for export, f.o.b., in the next half year range from £33 to £35. The American de-

mand is quiet. Business in Indian manganese ores is hampered by lack of freight facilities.

Iron and Industrial Stocks

NEW YORK, Jan. 31, 1917.

The stock market generally has been listless, indicating a disposition among speculators and investors to await developments. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	27	28 1/2	Int. Har. Corp., com.	85
Allis-Chal., pref.	83 3/4	85 1/4	La Belle Iron, com.	78 1/2- 81
Am. Can., com.	45 1/2	51 1/2	Lacka, Steel	83 - 86 1/2
Am. Can., pref.	109 1/4	110 5/8	Lake Sup. Corp.	18 7/8 - 19 3/8
Am. Car & Fdy., com.	67 1/2	69 7/8	Lima Loco.	58 - 59 1/2
Am. Car & Fdy., pref.	118	118	Lukens, 1st pref.	99 - 99 1/2
Am. Loco., com.	74 3/4	78 3/4	Midvale Steel	56 1/2 - 60 1/2
Am. Loco., pref.	106 1/4	106 1/4	Nat. Acme	35 1/2 - 38 1/4
Am. Rad., com.	420	425	Nat. En. & Stm., com.	30 1/2 - 32 1/2
Am. Ship, com.	62	64 1/4	Nat. En. & Stm., pref.	96
Am. Stl. Fdries.	60 1/2	62	N. Y. Air Brake	148 - 155
Bald. Loco., com.	53 3/4	55 1/2	Nova Scotia Stl.	110 - 112
Bald. Loco., pref.	101 1/4	102	Penn-Seaboard	50 - 53
Beth. Steel, com.	421	450	Pitts. Steel, pref.	101 1/4 - 102
Beth. Steel, com., new	126	136	Pressed Stl., com.	79 3/4 - 83 1/4
Beth. Steel, pref.	125	129 1/2	Pressed Stl., pref.	106
Carbon Stl., com.	95	95	Ry. Steel Spring, com.	51 - 53 3/4
Case (J. L.), pref.	86	88	Ry. Steel Spring, pref.	101
Central Fdy., com.	23	24	Republic, com.	76 1/4 - 80 1/2
Charcoal Iron, com.	7 3/4	8	Republic, pref.	104 - 104 1/4
Charcoal Iron, pref.	7	7	Sloss, com.	63 - 67
Chic. Pneu. Tool.	71 3/4	74	Superior Steel	32 1/2 - 34
Colo. Fuel	46 1/2	48 1/2	Superior Steel, 1st pref.	99 - 100
Cruc. Steel, com.	60 1/2	65 1/2	Transue-Williams	46 - 46 1/2
Cruc. Steel, pref.	114 1/4	115	Un. Alloy Steel	50 - 51 1/2
Deere & Co., pref.	99 1/4	100	U. S. Pipe, com.	21 5/8 - 23 1/2
Driggs-Seabury	45 1/2	50 1/2	U. S. Pipe, pref.	62 3/4 - 63
Gen. Electric	169	171 3/4	U. S. Steel, com.	111 1/4 - 115 1/2
Gt. N. Ore Cert.	35 1/2	38	U. S. Steel, pref.	120 1/4 - 121
Gulf States Steel	120	127	Va. L. C. & Coke	50 1/4 - 55
Harb-Walk. Refrac., com.	127	127	Warwick	9 1/2 - 9 1/4
Int. Har. of N. J., com.	120	122	Westing. Elec.	52 1/4 - 53 1/2

Dividends

The Taylor-Wharton Iron & Steel Company, regular quarterly, 1 1/4 per cent on the preferred stock, payable Feb. 1.

The Colorado Fuel & Iron Company, 4 per cent on the preferred stock, payable Feb. 20.

The National Acme Company, quarterly, 1 1/2 per cent, payable March 1.

The Kentucky Solvay Coke Company, quarterly \$2 and extra \$4 per share, payable Feb. 10, and special \$12.50, payable March 1.

The National Lead Company, regular quarterly, 1 1/4 per cent on the preferred stock, payable March 15.

The J. G. Brill Company, regular quarterly, 1 per cent on the preferred stock, payable Feb. 1.

The Scovill Mfg. Company, extra 10 per cent, payable Feb. 1.

The American Brass Company, quarterly, 1 1/2 per cent and extra 11 per cent, payable Feb. 15.

The Standard Screw Company, extra 50 per cent in cash, Feb. 15.

The Canada Foundries & Forgings Company, quarterly, 3 per cent and extra 3 per cent on the common stock, payable Feb. 15, and quarterly 1 1/4 per cent on the preferred stock, payable Feb. 15.

The Penn Seaboard Steel Corporation, quarterly, 1 per cent, payable Feb. 1.

The American Window Glass Machine Company, 12 per cent on the preferred stock, payable Feb. 3.

The Pressed Steel Car Company, quarterly, 1 1/4 per cent each on the common and preferred stocks, the preferred payable Feb. 1 and the common March 7.

The International Harvester Company of New Jersey, preferred, regular quarterly, 1 1/4 per cent, payable March 1.

The International Harvester Corporation, regular quarterly, 1 1/4 per cent, payable March 1.

The Pittsburgh Steel Company, preferred, regular quarterly, 1 1/4 per cent, payable March 1.

The Charcoal Iron Company, preferred, 2 per cent, payable March 31.

The Standard Sanitary Mfg. Company, 1 1/2 per cent on the common stock and 1 1/4 per cent on the preferred stock, payable Feb. 16.

The United States Steel Corporation, regular quarterly, 1 1/4 per cent on the preferred stock, payable Feb. 27, and regular quarterly, 1 1/4 and extra 1 1/4 per cent on the common stock, payable March 30.

The Mohegan Tube Company, maker of tubing for automobile, bedstead and mechanical use, has moved from Davis Street, Long Island City, and is now located at Scott Avenue and Meserole Street, Brooklyn, N. Y.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

Jan.	Lake	Electro-	Tin,	Lead		Spelter	
				New York	New York	New St. Louis	New York
24	31.50	31.50	45.12 1/2	7.85	7.75	10.12 1/2	9.87 1/2
25	32.00	32.00	45.00	7.90	7.80	10.25	10.00
26	32.25	32.25	45.00	7.90	7.80	10.50	10.25
27	32.25	32.25	45.00	8.00	7.87 1/2	10.50	10.25
28	32.50	32.50	45.50	8.00	8.00	11.00	10.75
29	33.00	33.00	45.75	8.15	8.00	10.75	10.50

NEW YORK, Jan. 31, 1917.

Copper is stronger but prices are entirely nominal. Tin has steadily advanced, but trading has been light. The acute scarcity of prompt and nearby lead has sent quotations up. Spelter, after advancing sharply, again shows a tendency to weakness. Small arrivals of antimony are responsible for higher prices.

New York

Copper.—Deliveries of prompt and nearby copper are practically unobtainable and the nominal quotations are higher, some interests putting strictly spot metal at 35c. to 36c. The scarcity is puzzling in view of the fact that so much copper was available at the time of the recent decline which followed the talk of peace. The producers show no disposition to sell for the first half, and second hands and consumers are equally reluctant to part with any of their holdings. Less talk is heard of the big foreign order which, according to rumor, was to be placed for last half delivery. The large purchase made last year by the Entente Allies, which calls for the exportation of 200,000 gross tons in the first six months of 1917, has not yet begun to show in the exports which this month, including yesterday, total 23,551 tons. The producers are unquestionably behind in their deliveries, largely because of the extent to which severe weather has hampered railroad operations in the West. The January output is estimated at 183,000,000 lb., against 210,000,000 lb. in December. Nominal quotations for nearby electrolytic yesterday were 33c. to 33.50c. March was 31.50c. to 32.50c., and second quarter 31c. Lake is nominally about the same levels. The London quotation advanced in the week and is now £143 for spot, but means little in view of its being fixed by the British Government.

Tin.—Deliveries into consumption in January reached the unusually large total of 7177 tons. This makes a new record, the highest previous figures on deliveries having been 6398 tons in June, 1916. Of the deliveries 1977 tons came via Pacific ports. There is now in stock and landing 2622 tons. The only notable sale of the week was on Jan. 24, when 160 tons was taken for even distribution over the first quarter, the transaction being rather a mysterious one as neither the parties concerned nor the buyers were reported. On Monday and Tuesday the total sales amounted to about 200 tons. The London market has been advancing steadily and some important London interests have been buying actively, which probably accounts for the manner in which prices here have advanced. Straits was quoted in New York yesterday at 45.75c. The arrivals this month total 4320 tons and there is afloat 3033 tons.

Lead.—The tangled freight situation in the West has played havoc with the lead market. How bad conditions are is indicated by the fact that a New York dealer has had lead in transit since early November. There are thousands of tons en route to the East but the greatest uncertainty exists as to where the shipments may be or when they will arrive. Meanwhile there is an almost complete exhaustion of stocks in the hands of both dealers and consumers. At least two consumers have had to shut down their works for want of material and others may have to do likewise. On Monday the American Smelting & Refining Company advanced its quotation to 8c., New York, but it is not selling at this figure, merely using it as a basis for

averages. Following this advance outsiders asked and in some cases obtained 8.25c., New York, although in some quarters it is possible that 8.15c. might be done for small lots. Fear exists that the market may break sharply when the lead in transit gets through. The demand for prompt and nearby is good with transactions confined to 5-ton lots. The exports this month, including yesterday, total 1290 tons. The London market is unchanged at £30 10s.

Spelter.—Until Monday night the spelter market was gathering strength and the New York quotation had touched and exceeded 11c. The price was apparently attractive to sellers and they offered spelter so liberally that a reaction set in and prices dropped 1/4c. or more. The New York quotation yesterday was about 10.75c. for prompt and February and that at St. Louis about 10.50c. March was available at about 10.50c., New York, and 10.25c., St. Louis. The second quarter is quoted around 9.75c., St. Louis. The cause of the decline yesterday was due to the fact that consumers did not take hold sufficiently to support the rise.

Antimony.—Prompt Chinese and Japanese antimony has advanced several cents per pound and 23c. to 25c., duty paid, is quoted. The reason for the stronger market is almost entirely due to delays in the arrivals here of shipments from the Pacific coast by way of Vancouver. New York warehouses are said to contain not a little of the metal, but the holders are reluctant to let go of it in view of the uncertainty as to when fresh supplies will arrive.

Aluminum.—The quotation for No. 1 virgin aluminum is stronger at 58c. to 60c.

Old Metals.—The market continues to gain strength. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	28.50 to 29.50
Copper, heavy and wire	27.50 to 28.00
Copper light and bottoms	24.00 to 25.00
Brass, heavy	17.50 to 18.00
Brass, light	13.00 to 13.50
Heavy machine composition	23.00 to 24.00
No. 1 yellow rod brass turnings	18.00 to 19.00
No. 1 red brass or composition turnings	19.00 to 20.00
Lead, heavy	7.25
Lead, tea	6.75
Zinc	8.00 to 8.50

Chicago

JAN. 29.—With the demand for copper running in excess of the ready supply, prices have steadily mounted. For the higher prices of other metals, shipment delays are largely responsible. We quote: Casting copper, 30c.; Lake copper, 33c.; tin, carloads, 46c., and small lots, 48c.; lead, 7.95c. to 8.25c.; spelter, 10.75c.; sheet zinc, 21c.; Cookson's antimony, 50c.; other grades, 23c. to 25c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 24.50c.; copper bottoms, 22c.; copper clips, 23.50c.; red brass, 22c.; yellow brass, 17c.; lead pipe, 6.50c.; zinc, 6.50c.; pewter, No. 1, 28c.; tinfoil, 32c.; block tin pipe, 37c.

St. Louis

JAN. 29.—There has been a stronger feeling, and prices to-day on less than carload lots were as follows: Lead, 8.65c.; spelter, 12.50c.; tin, 49c.; Lake copper, 32c.; electrolytic copper, 31.50c.; antimony, 21c. On carload lots the quotations were: Lead, 8c.; spelter, 10c. to 10.25c. In the Joplin district the prices for ore were marked up, with zinc blende ranging from \$70 to \$90, and the average for the week \$81. Calamine was strong at \$45 to \$50, with average \$48. Lead ore jumped from \$91.50 to \$100, and the average for the week was \$95. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 9.50c.; heavy yellow brass, 12c.; heavy red brass and light copper, 18c.; heavy copper and copper wire, 19c.; pewter, 25c.; tinfoil, 33c.; lead, 5.50c.; tea lead, 3.50c.; zinc, 5.50c.

The William B. Pollock Company, Youngstown, Ohio, has received a contract to build a third blast furnace for the Tata Iron & Steel Co. at Sakchi, India. This stack will probably be able to turn out about 500 tons per day, and the contract calls for its completion by July 1. However, owing to scarcity of materials and labor, it will likely be later in the year before it is completed.

Greatest of Foreign Trade Conventions

(Continued from page 325)

port of the National Foreign Trade Council on the Webb bill, describing fully the status of the amendments made to it in the House and indicating the probable course in the Senate. The council's work in behalf of this measure has been an important influence.

J. J. Donovan, Bellingham, Wash., told of the necessity for co-operation in exporting lumber. The Douglass Fir Company, the corporation through which the lumber trade of the Pacific coast carries on its exports, was believed by all connected with it to be legal, and even without the formal authorization of the Webb bill they had gone ahead "believing that we might as well go to jail for combining as to go to the poorhouse for the lack of combination."

Suggested Methods

"Suggested Methods of Co-operation in Foreign Trade" was the title of a report prepared by a committee of the council, of which H. C. Lewis, manager National Paper & Type Company, New York, was chairman. This presented the following plans for the organization of co-operative export selling companies:

1. A group of large manufacturers, closely identified, making kindred but generally non-competing products.
2. A group of manufacturers controlled by one company making kindred and non-competing products.
3. A large group of small manufacturers, each entirely independent, whose products are allied and which may be both competing and non-competing.
4. A group of manufacturers making similar and generally competing products, who co-operate with one selling organization on a commission basis.
5. A group of producers of raw materials, who unite in one general selling agency for the disposition of their export products.

Under each of these plans the committee discussed in detail the procedure to be followed. Besides Mr. Lewis the members of the committee were: J. J. Donovan, vice-president Bloedel-Donovan Mills, Bellingham, Wash.; E. H. Huxley, president United States Rubber Company, New York; Gilbert H. Montague; C. M. Muchnic, vice-president American Locomotive Sales Corporation, New York; E. P. Thomas, president United States Steel Products Company, New York.

The Government's Hand in Exports

Co-operation in exports was fully discussed at a group meeting held Thursday afternoon. Ernest B.

Filsinger, foreign sales manager of Lawrence & Co., Boston and New York, presented a paper entitled "Governmental Co-ordination of Export Activities." Mr. Filsinger advocated the formation of an advisory council for the Bureau of Foreign and Domestic Commerce. He said this should consist of 12 or 14 men representing leading American industries, and that the council should be appointed by the President. He believed that such a council could render invaluable aid in securing co-operation between the Government and business interests. He also stated that a definite export policy should be fostered by the Government. Successful experience of business men and the knowledge of trade experts should be utilized by the Government whenever available. He advocated the publication of a new journal to take full advantage of the opportunities presented to the bureau to use available data. This would be supplementary to the *Commerce Reports* issued by the Bureau of Foreign and Domestic Commerce. The prejudice now existing against the use of private names in government publications should be discarded.

In the five-minute discussions that were allowed in this session many valuable ideas were brought out in regard to the development and retention of foreign trade, particularly with reference to the smaller manufacturer. A suggestion that was very favorably received was made by W. C. Coffin of the Knox Pressed & Welded Steel Company. He advocated the formation of an association by, say, eight to twelve leading concerns engaged in practically the same lines, but which are not competitive. For instance, this association could embrace in its membership a leading steel fabricating concern, also a maker of roofing and another concern turning out sheeting and others making materials entering into the construction of steel buildings. This association could appoint a man to cover foreign countries in search of trade, and each concern would be taxed for its pro rata share of the expenses. By doing this, a contract could be taken for the complete erection of a steel building or other steel work, each concern in the association to furnish its own particular product that would enter into the construction of such a building. It was also the consensus of opinion that the passage of the Webb bill would do much to allow smaller manufacturers to get together and by combined effort develop foreign trade.

F. R. Drake, of the foreign affairs committee of the National Wholesale Grocers' Association, presented an address on "How the Export Trade Has Employed the Metric System in Foreign Commerce."

Export Problems of Smaller Companies

Among the group meetings the one which drew by far the largest attendance was that devoted to the export problems of the smaller manufacturer and merchant. While it was not made clear what manufacturers and merchants were referred to by the designation "smaller," most of those who attended seemed to have put themselves in that class. In advance of the convention a pamphlet of 15 pages had been prepared in which typical questions coming up from those who wanted to engage in export trade

were answered. To some of the questions four or five or a half dozen answers were given on the printed page. As representative of these questions the following are given:

How can I learn what countries are best suited to make a start for the sale of my goods?

If I decide to send my own salesmen, shall I employ men who speak the language, but do not know my goods, or can I send men who know my line but do not speak the language?

If it seems best to establish local agencies, where can I find the names, and how can I most easily get in touch with the right men to represent me?

If I could induce some manufacturers to combine with me, what is the best working arrangement to make? How can matters be fixed so that the greatest results can be obtained from a joint agent?

If none of the methods suggested seems feasible, could the export commission houses be used? If so, what is the easiest way to get in touch with the commission houses and find the right ones for the purpose?

Should exclusive sales arrangements be made with export commission houses?

If a catalog is used, how should it be prepared and what can be done to insure a proper distribution, so as to avoid waste?

How is it possible to arrange matters in order to get cash before shipments leave the United States?

How should an export department be organized?

The smaller manufacturer and merchant group, which was presided over by E. M. Herr, president Westinghouse Electric & Mfg. Company, was much interested in the suggestion by one delegate that it is important to know in detail concerning the grades of various products that are most used in countries to which exports are made. A resolution was adopted expressing the sense of the conference that the Bureau of Foreign and Domestic Commerce instruct consular officers to get as full and complete details and classifications as possible of various manufactured products consumed in their respective countries.

Work of the Commerce Bureau

The great interest of all exporters in having the work of the Bureau of Foreign and Domestic Commerce made as efficient as possible was frequently in evidence. One delegate urged that the Department of Commerce be memorialized for an increase in the number of commercial attachés in foreign countries. In this connection it was suggested that these appointments should be determined to a con-

siderable degree by business experience and not alone by ability to pass examinations. It was brought out also that the recent additions to the number of attachés have so increased the detail work of the Bureau of Foreign and Domestic Commerce that Congress is now being asked to make larger appropriations for the work of the office at Washington.

E. J. Gillan, of the Pan-American Commission Corporation, New Orleans, told of the work of the Mississippi Valley Latin-American Association which had been formed to bring Latin-American buyers to New Orleans and to make the best arrangements for return cargoes from South America.

A delegate who represented an independent oil firm told of working through the Commercial Museum in Philadelphia in the beginning of its foreign trade. It sent out widely a monthly price list and found that nothing interested the consumer like prices. For a long time many to whom these price lists went made no response, but on the breaking out of the war inquiries began to pour in and business resulted directly traceable to the persistent sending out of price lists. George L. Lewis, of the Lewis Electric Welding & Mfg. Company, Toledo, spoke of the establishment of co-operative show rooms at South American points as a necessity, that representatives in such cases be perfectly familiar with the language of both the producer and the consumer. A Boston delegate said that one of the best plans was to bring the South American representative of exporting producers to the factory, where they could get imbued with the spirit of the maker.

In another group meeting the questions discussed were of almost equal interest to the smaller exporter, since they dealt with the function of the export merchant and commission house. The topics here were the functions of the export merchant, the services rendered by the merchant and the facilities at the command of the merchant for opening up foreign markets.

Declaration of Foreign Trade Principles

One of the most important documents presented at the convention was the declaration of the principles of foreign trade policy deemed necessary to prepare the United States for its permanent opportunities and responsibilities in world commerce. The declaration was drafted by the convention committee and was presented by the chairman, James A. Farrell, at the closing session on Saturday. It was ratified by the convention and thus becomes an expression of the sentiment of the 1305 delegates shown by the final count to have been in attendance. The report is as follows:

World conditions, because of the European war, offer to the United States both opportunities and responsibilities. These responsibilities must be recognized if the United States is to realize the opportunities. The share of the world's commerce to which the United States aspires is that to which its resources, productive capacity, enterprise and skill entitle it. No thoughtful, patriotic American citizen desires more or will be content with less.

Efficient Industry and Trained Men

Our trade must depend for its future development primarily upon the efficiency of our agricultural and industrial production, upon the enterprise of American manufacturers, merchants and bankers, and upon the training of youth in our schools, colleges and universities. The wider distribution of the benefits of foreign trade is dependent upon the participation of a steadily

increasing number of industries and enterprises of moderate size. Governmental agencies, the Department of State, with the diplomatic and consular services, the Department of Commerce, the Federal Reserve Board and the Federal Trade Commission can assist American enterprise by the negotiation of advantageous commercial treaties, by collecting and disseminating information regarding foreign markets, and suggesting improved financing, selling and purchasing methods. These governmental agencies have already rendered and can render still greater assistance to merchants or manufacturers desirous of extending their foreign trade, but in the last analysis success is to be attained only on the courage, intelligence and efficiency of the merchants, the manufacturers and the bankers themselves, the co-ordination of their efforts, and their ability to co-operate with each other and with the Government departments created to serve them.

To meet world competition, however, American business, using the term in its broadest implication, must be relieved of disadvantages imposed by legislation and protected by governmental action from possible discrimination in foreign markets.

Sentiment Crystallized by the Convention

The discussion in this convention has emphasized the vital importance, as bearing upon the future of our foreign trade, of certain questions which are being or should be considered:

1. Doubt as to the application of the anti-trust laws to export commerce should be removed. Congress should promptly enact in principle the Webb bill, now

pending in the Senate, with the modifications hitherto recommended by the Federal Trade Commission, to the end that American exporters generally, while marketing abroad the products of American agriculture and industry, may have the advantages of co-operative action in their efforts to meet foreign combinations.

2. The chief duty of the United States Shipping Board should be to develop a sound national shipping policy, calculated to attain the following objects:

a. The increase of national income and of domestic prosperity by affording greater facilities for the sale abroad of products of the soil and industry of the United States, and for the importation of foreign materials and products necessary to American life and industry.

Merchant Marine

b. The development, under the American flag, of transportation service with foreign countries and with the possessions of the United States.

c. Aid to national defense and maintenance of foreign commerce, whether the United States be belligerent or neutral.

To render our foreign commerce reasonably independent of foreign carriers there will be required a merchant tonnage so great that it can only be sustained on the basis of ability to compete for the world's carrying trade with the vessels of other nations. Such disadvantages in cost of operation as are imposed by economic conditions should be offset by greater efficiency, but it is the duty of the Government to offset those imposed by legislation.

Commercial Treaties

3. While it is impossible to anticipate the future relations of the nations now at war, with one another and with neutrals, it is certain that ante-bellum conditions will be radically altered. Commercial treaties under which the world's trade was conducted prior to August, 1914, have been ruptured by the war. The negotiation of new agreements between the members of both belligerent groups, between these groupings and neutrals, and the relations between the groups themselves, will necessitate a complete readjustment of the arrangements formerly in force. The United States

will inevitably be obliged to negotiate new commercial treaties to conform to the bases fixed by other nations to govern their relations with each other. The possible effects of European economic alliances and preferential or discriminatory tariffs that may be imposed thereunder upon American treaty relations and American trade, should be given careful consideration by the Congress and by the proper departments of the Government, including the Tariff Commission.

The State Department has already created a bureau which is studying these problems. This bureau should be enlarged and enabled to secure the services of experts. This work of the Department of State should be co-ordinated with the activities of the Department of Commerce, and both these departments should co-operate closely with the Federal Reserve Board, the Federal Trade Commission, the Shipping Board and the Tariff Commission, when organized. The Department of State, through this treaty bureau, should consult with commercial organizations and business men individually, in order that their needs may be taken into consideration.

Administrative Method of Tariff

Whatever be its underlying principle, the United States tariff system should possess adequate resources for the encouragement and protection of the foreign trade of the United States. To assure to the United States the continuance of the favorable treatment which our commerce enjoyed before the war and to protect American exports against discrimination in foreign markets, Congress should adopt the principle of a flexible or bargaining tariff.

In submitting the foregoing considerations to this convention your committee desires to express its appreciation of the spirit of co-operation which has already been evidenced by the Departments of State and Commerce, and by the Federal Reserve Board and the Federal Trade Commission, and of their readiness to assist business men throughout the country. We believe it to be the sense of this convention that the National Foreign Trade Council and the delegates here assembled individually will consider it a privilege and a duty to co-operate with these governmental agencies in their efforts to encourage the development of American foreign trade.

Training for the Export Trade

In a Thursday evening session, presided over by Chancellor McCormick, University of Pittsburgh, Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce, gave an address on a Government employment information service for foreign trade. Dr. Pratt's bureau is receiving many applications for men to fill various places which call for a knowledge of foreign trade. He doubted if the schools of commerce are providing the extent or quality of instruction which the situation demands. The graduates of such schools have only a hazy, academic equipment for foreign trade work. Some good courses on the practical side of the export trade are being given by a few special schools—one in Chicago, another in New York and a third in a New England school of commerce. Various banks and other corporations are conducting schools of their own. The speaker said that beginning July 1 the bureau would start an employment exchange for men who have had actual experience in foreign trade or are definitely qualified for foreign trade work. Applications will be received only from persons who have had experience as follows:

1. Those who have held responsible positions in export departments of concerns engaged in export trade.
2. Those who have had actual experience in the foreign field as trade representatives.
3. Those who have had actual experience in import trade in a foreign country.

The objects of the bureau in this movement are:

1. To get in touch with the best men for positions

in the Bureau of Foreign and Domestic Commerce.

2. To do something for men obviously well qualified but unemployed or desiring to better themselves.

3. To enable the bureau to answer intelligently the numerous inquiries received from employers.

At the same meeting E. H. Huxley, United States Rubber Company, told of the steps that must be taken to prepare young men for international commerce, and G. A. Aerts, of the Cincinnati Chamber of Commerce, told of what the business man wants in the training of those he employs for export work. W. H. Lough, Business Training Corporation, New York, spoke of the subjects essential in teaching the technique of exporting.

In reporting to the main convention for the educational section Chancellor McCormick said that the universities which have schools of commerce and economics are awake to the demands upon them in preparing men for foreign trade and are working out curricula with a view to greater efficiency in this work.

Personal

The banquet of Friday evening at the William Penn Hotel was attended by nearly 1100 persons. The toastmaster was W. L. Clause, a leading business man of Pittsburgh, president of the Pittsburgh Plate Glass Company. The addresses were made by E. N. Hurley, chairman of the Federal Trade Commission; John D. Ryan, president of the Anaconda Copper Mining Company; James A. Farrell, presi-

dent of the United States Steel Corporation, and Judge Joseph Buffington.

The general convention committee consisted of the following: Chairman, James A. Farrell, New York; C. E. Thomas, New York; R. H. Downman, New Orleans; E. M. Herr, Pittsburgh; Festus J. Wade, St. Louis; S. B. McCormick, Pittsburgh; Welding Ring, New York; M. F. Bristol, Rochester, N. Y.; J. G. Arnold, Chicago; Robert Dollar, San Francisco; J. J. Donovan, Bellingham, Wash.; J. Rogers Flannery, Pittsburgh; B. F. Harris, Champaign, Ill.; Daniel Warren, New York; R. L. McKellar, Louisville, Ky.; George B. Burgess, Memphis; W. L. Clause, Pittsburgh; Benjamin Joy, Boston; Robert Newton Lynch, San Francisco; Dennis F. O'Brien, Newark, N. J.; F. D. M. Strachan, Brunswick, Ga.; C. H. Haney, Chicago; H. G. Herget, Pekin, Ill.; E. A. Miner, Rochester; Alba B. Johnson, Philadelphia; William Pigott, Seattle; Willard Straight, New York; S. K. Taylor, Mobile; W. T. Buckley, Buffalo; G. M. Courts, Galveston; Frank G. Odell, Omaha; Charles McClure, Saginaw, Mich.; R. I. Ingalls, Birmingham, Ala.

Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce, was accompanied to the convention by a number of representatives of that bureau who gave information and counsel to delegates seeking light on various questions connected with exports. The bureau had on exhibition a large collection of samples gathered from all parts of the world showing the character of products in various lines, notably hardware, marketed by manufacturers in other countries.

The Pan-American Union had special headquarters at the convention, in charge of William A. Reid.

G. A. O'Reilly, foreign trade representative Irving National Bank, New York, acted as secretary in charge of volunteer trade advice. There were 35 of these volunteer trade advisers, and both informally and in the group meetings they freely answered questions on methods of procedure in the export trade. Many of them were representatives of important companies which carry on a large foreign trade.

Alba B. Johnson was the same effective, diplomatic and dispatching presiding officer he had shown himself to be in the conventions at New Orleans and St. Louis. Secretary Robert H. Patchin carried a greater load than at any previous convention and to him was due in large measure the putting through of so full and valuable a program with a minimum of change and disappointment. The experience gained in the last two conventions was turned to excellent account.

No Bethlehem Bonds Soon

The Bethlehem Steel Corporation has issued a denial that a sale of any of its bonds is contemplated in the near future. The statement was made in amplification of that made by Charles M. Schwab, chairman of the board, that the directors are considering the advisability of making further provision for future needs. It says: "The company is simply taking advantage of the assemblage of stockholders at the forthcoming annual meeting in April to obtain the necessary authority for a mortgage in order that bonds may be available for issue when the time comes."

Manganese ore exports from India in September, 1916, were only 58,632 gross tons against 66,000 tons in September, 1915. Of the shipments last September, 46,232 tons went to the United Kingdom, 8250 tons to France, 2000 tons to Italy and 2150 tons to the United States.

THE U. S. STEEL PENSION FUND

Report for 1916 of the United States Steel and Carnegie Pension Fund

The sixth annual report of the United States Steel and Carnegie pension fund shows that the distribution for 1916 to employees of every plant or department of the Steel Corporation's subsidiaries amounted to \$711,130.33, making the total distribution for the six years of the existence of the fund nearly \$3,000,000, or \$2,945,541.08. Last year the distribution was \$659,389.42 and the distribution for 1914, \$511,967.90.

There are now nearly 3013 pension cases, which is only 11 more than were active on Jan. 1, 1916. In 1916 275 were added, against 697 for the year 1915. The number of cases discontinued in 1916 was 264, against 216 for 1915. The average age is now 65.33 years, against 62.84 last year. The term of service is now nearly 30 years, being 29.93, while last year it was 28.34 years. The average monthly pension amounts to \$21.05, which is 20 cents more than was the case a year ago and 60 cents more than two years ago. The minimum pension paid is \$12 per month and the maximum \$100 per month.

The centralization of the Steel Corporation plants in the Pittsburgh district naturally places the amount distributed there much above that of any of the other industrial centers. In the Pittsburgh and Valley districts the amount distributed in 1916 amounted to \$396,544.78. This amount includes pensioners of the coke and coal companies operated in Pennsylvania. In the Cleveland district the distribution amounted to \$79,498.74, and in the Chicago district the amount was \$81,406.38. In the Eastern Seaboard and New England States, the distribution amounted to \$95,320.36, and on the Pacific Coast \$1,502 was distributed.

To retired employees of the corporation's mills and mines of the South a total of \$7,045.95 was paid, and to the retired Northwestern ore miners the sum of \$30,013.12 was paid. The total amount distributed to retired coal, iron ore and limestone miners was \$105,736.23. The report shows that \$19,038.97 was paid to retired employees of the corporation's transportation lines and terminals, both rail and water. Of the total distribution of nearly three-quarters of a million dollars but \$13,879.55 was paid to retired general office and sales department employees.

Retired employees of the Carnegie Steel Company drew the largest amount from the pension fund, heading the list with \$170,981.98. Of this amount \$37,818.60 was paid to retired Homestead workmen, and \$37,350.45 to retired Edgar Thomson workmen. The American Steel & Wire Company's retired employees came next with \$150,520.06; the American Sheet & Tin Plate Company with \$72,956.64; The National Tube Company with \$72,435.70; the H. C. Frick Coke Company with \$72,528.51, and the American Bridge Company with \$52,958.79.

The fund from which the pensions are paid amounts to \$12,000,000, being made up from the \$4,000,000 Carnegie Relief Fund, established by Andrew Carnegie prior to the formation of the Steel Corporation, and \$8,000,000 which was set aside by the Steel Corporation for this purpose.

Bridgeport Employers' Association

A meeting of local manufacturers was held in the Stratfield Hotel, Bridgeport, Conn., Jan. 22, which resulted in the formation of an employers' association. Among the speakers at the meeting were Clarence E. Whitney, president Hartford County Employers' Association; Charles G. Phelps, secretary New Haven Employers' Association; Wilson H. Lee, president New Haven Association; Charles L. Taylor, president Hartford Manufacturers' Association; L. G. Kibbe, president Litchfield Employers' Association; T. J. Kelly, secretary Hartford County Employers' Association, and C. H. Brewer, vice-president Winchester Repeating Arms Company, New Haven.

OBITUARY

FRANK L. FROMENT, of Froment & Co., iron and steel merchants, Bank and Washington streets, New York, died Jan. 29 in Miami, Fla., aged 65 years. He had gone South early in the winter in the hope of recuperating from an illness dating from last August. Mr. Froment was born in New York City, beginning his connection with the iron and steel business with Piereson & Co., then at 26 Broadway. He was next connected with A. R. Whitney, who was for a long time a prominent figure in the New York structural trade. About 35 or 36 years ago Mr. Froment engaged in business for himself as a merchant at 88 Washington Street. The office was subsequently moved to 112 John Street, then to Bank and West Streets and finally to its present location, where a large and well equipped warehouse was specially built. Mr. Froment was a director of the Greenwich Bank and the Stuyvesant Insurance Company and was also actively interested in religious and benevolent institutions. He leaves his widow, a daughter and two sons.

GEORGE H. CHANNELL, superintendent for 12 years of the plant of the Union Spring & Mfg. Company, New Kensington, Pa., died Jan. 28, aged 56 years. He had previously been superintendent of the Charles Scott Spring Company, Philadelphia, which was taken over by the Railway Steel Spring Company of America. He leaves his widow and one daughter.

JOHN J. LAWLER, for many years superintendent of the transportation and labor departments of the Homestead steel works of the Carnegie Steel Company, died at his home in Munhall, Pa., Jan. 21.

Spiegeleisen from Virginia Manganese Ores

The U. S. Manganese Corporation, 74 Broadway, New York, is mining manganese ore regularly now at Elkton, Va., and shipping it to the Temple furnace near Reading, Pa. The ore is reported to average over 45 per cent manganese. This furnace, which is controlled by the Seaboard Steel & Manganese Corporation, will probably start to produce spiegeleisen about Feb. 15. Interests affiliated with these companies are also mining an ore averaging about 30 to 35 per cent manganese, at Vesuvius, Va., 60 miles north of Elkton. This ore is being sent to the same blast furnace. These ores, with others, will be first converted into spiegeleisen and later ferromanganese will be the product. The company has already a large quantity of ore on the ground and has made sales of several 1000 tons of spiegeleisen at \$60 to \$65 per ton.

New Norwegian Pig-Iron Plant

In 1915 the Association of Norwegian Engineers appointed a committee to study the problem of developing the national iron industry. In 1913 Norway exported 373,000 tons of iron ore and 195,000 tons of iron concentrates in briquette form, for all of which she received \$1,100,000. On the other hand, she imported 160,000 tons of iron, for which she had to pay over \$6,000,000. The above-mentioned committee suggests the erection of a plant to produce 50,000 tons of pig iron annually, utilizing the water power near Narvik, the terminus of the Kiruna & Narvik Railroad, by which Sweden sends annually about 3,000,000 tons of iron ore from her northern mines at Kiruna to the port at Narvik. According to the proposed scheme, Norway is to buy a tenth part of the ore for the new furnaces.

The annual report of the American Brass Company for 1916 shows a surplus after dividends of \$7,241,669 as compared with \$4,178,353 for the previous year. The net profits for 1915 were \$6,128,453, but in 1916 they were \$10,991,669. The balance sheet of Dec. 31 shows a surplus of \$20,019,675, as compared with \$12,778,005. Current assets are \$25,756,037; current liabilities, \$1,905,892. The net working capital is \$23,850,145, an equivalent of 159 per cent on the stock.

Society of Terminal Engineers

Another engineering organization, the Society of Terminal Engineers, has been chartered under the laws of the State of New York, with headquarters in New York City, to promote "the study of terminal engineering and mechanical freight handling as a specialty." The new organization has three grades of membership, members, associate members and juniors. The member's grade is open to professors of civil and mechanical engineering, and engineers specializing in terminal work. Associate membership applies to officers and others connected with concerns manufacturing freight handling appliances and terminal equipment, and those whose work and interests enable them to co-operate in the aims of the society. Junior members comprise recent graduates of recognized technical schools who will specialize in terminal engineering and young engineers qualified to fill subordinate positions in terminal work.

A rate of \$6 per year, without initiation fee the first year, has been fixed as dues for membership. Regular monthly meetings are to be held in New York.

The organization so far effected is: President, H. McL. Harding, New York; vice-presidents, Gen. W. H. Bixby, U. S. A., Washington, D. C., and John Meigs, Philadelphia; treasurer, W. J. Barney, New York; secretary, J. Leonard, 1133 Broadway, New York.

The Air Reduction Company

The Air Reduction Company, 120 Broadway, New York, established about a year ago, has taken over the Superior Oxygen Company of Pittsburgh, including its plants in New York, Illinois, Ohio and Missouri; also the Niagara Oxygen Company of Buffalo and the Searchlight Company of Chicago, manufacturer of acetylene, with branches through the country. It has also installed plants for the manufacture of oxygen and nitrogen at Philadelphia and Detroit, and has other plants under construction at Cleveland and elsewhere. Its plant at Jersey City, under construction, will be the home factory. The company will establish there a department for the manufacture of all its equipment, a school for welding and cutting, an experimental plant and a research department.

Officers of the company are Walter W. Birge, president; Stirling H. Thomas, vice-president and treasurer, and Maurice W. Randall, secretary. The directors are Frederick B. Adams, Frederick W. Allen, Walter W. Birge, Paul Delorme, Edmund Descharts, W. T. P. Hollingsworth, L. F. Loree, Ambrose Monell, Robert C. Pruyn, Samuel F. Pryor and Percy A. Rockefeller.

C. R. Greer, secretary of the Chamber of Commerce, Hamilton, Ohio, has issued his report of the activities of that organization in 1916. The membership is now 712. The city's industrial growth is cited as evidence that the year was one of the most prosperous in the history of Hamilton. In the list of new manufacturing plants secured are the Simplex Machine Tool Company, Fischer Can Company, Kleak Brothers Company, Buckeye Marble Company and Vail-Rentschler Tractor Company.

The Marlin Arms Corporation, New Haven, Conn., has received another \$3,000,000 contract for machine guns of the same pattern as the company has been turning out for Russia. The company has acquired the patents and the services of Lester T. Barlow, and will begin the manufacture of the aerial munitions invented by Mr. Barlow and developed by him in the Frankfort Arsenal, Philadelphia, with the co-operation of the United States Ordnance Department.

The John Lauson Mfg. Company, New Holstein, Wis., is working on orders for tractors from Spain, France, Cuba, Norway, Russia, Australia, South America and other parts of the world which will probably result in exports of over 1000 machines in 1917.

Basic Steel Company's Plans

Concerning the Basic Steel Company, which recently closed for a large tract of land at Niles, Ohio, Wade A. Taylor, president Deforest Sheet & Tinplate Company, of Niles, has made the following statement:

"The Basic Steel Company is an Ohio corporation formed in 1909 and is a subsidiary of the Deforest Sheet & Tinplate Company, the officers being Wade A. Taylor, president and treasurer, and Charles S. Thomas, vice-president and secretary. At the time of its organization the Basic Steel Company acquired some acreage adjacent to the property of the Deforest Sheet & Tinplate Company, this being held as a site for a steel plant to be built when needed by the Deforest Sheet & Tinplate Company.

"The purchase of land made by the Basic Steel Company last week comprises all of the 152-acre Heaton tract which fronts upon the Erie Railroad up to Deforest Junction, making a total frontage now owned by the Basic Steel Company and the Deforest Sheet & Tinplate Company of about 1½ miles running along the Erie Railroad and B. & O. tracks and extending in a transverse direction from the Erie Railroad tracks to the Mosquito Creek, a distance of about one mile, which gives the two companies ample room for future development and extension.

"It has not been definitely decided just when work will be started on the steel plant, as this depends upon some other matters now being rounded out, but the Deforest Sheet & Tinplate Company requires about 80,000 tons of raw steel per annum for its present finishing mills, over one-third the production of which is consumed normally by its pressed steel department, and which must be open-hearth grade.

"The Deforest Sheet & Tinplate Company's annual meeting does not occur until May, hence no statement has been made public, but its net profits for 1916 were over 95 per cent of its capital stock. Dividend disbursements, however, have been confined to its regular rate of 1 per cent monthly."

Malleable Foundry at Saginaw

The Saginaw Malleable Company, Saginaw, Mich., incorporated with a capital stock of \$350,000, will erect a malleable foundry on a site of 52 acres purchased on the south side of the city. The initial installation will include two melting furnaces with an annual capacity of 12,000 tons and will require a force of 450 workers. Provision is made for an ultimate capacity of 40,000 tons per year and a force of 1600 men. Those active in the formation of the company include George H. Hannum, general manager of the Jackson-Church-Wilcox Company of the General Motors at Saginaw; Charles F. Drozeski, for 20 years sales manager of the Illinois Malleable Iron Company of Chicago, and his son, D. A. Drozeski, who has been associated with him; and Julius B. Kirby of Saginaw.

Ferromanganese Imports in December

Ferromanganese imports into the United States in December were 4401 gross tons, as compared with 7914 tons in November. The December imports were the smallest in several months and less than the monthly average of 1915 which was 4600 tons. The largest imports in 1916 were 9787 tons in September and the total for the year was 77,836 tons, or 77 per cent of normal before the war. The December imports came in as follows: 2789 tons through Philadelphia, 810 tons through New Orleans, 667 tons through Baltimore and 135 tons through Newport News.

The slab mill of the Lukens Iron & Steel Company, Coatesville, Pa., which has been out of service for many years, is undergoing a complete overhauling, including the building of new gas producers. It is expected that the improvements will be completed within a month and the mill placed in service.

Farewell Dinner to W. A. Field

More than 300 friends of William A. Field participated in the dinner given in honor of the retiring general superintendent of South works, Illinois Steel Company, at the South Shore Country Club, Chicago, Jan. 26. It was a striking fact that in all the abundance of praise that was bestowed in the eager acknowledgments from friends of long standing, scarcely a word concerned Mr. Field's performance as a maker of steel, a capacity in which the records of South works give him high place. To his associates, within and without the works with which he had been for 25 years and which he had directed for 14 years, he was only the leader who had created organization with friendship, was "the boss" without being dictator, was the comrade without being the patron. The steel works was but one vehicle for the expression of his humanity which extended throughout the community and embraced literature and the arts. The tribute to Mr. Field was pre-eminently a tribute to a man.

P. A. Newton, successor to Mr. Field as general superintendent, was the toastmaster. Herbert F. Perkins, president Wisconsin Steel Company, speaking as the representative not only of a neighboring steel works but of one of the largest industries of the country, said that Mr. Field, more than any other man he knew, had discovered the secret of true organization, that to him more than to any other individual, managers of industry in the West were looking for leadership in solving those problems of adjustment between employer and employee, between capital and labor, which had been so important and so vexatious.

In behalf of the men of South works, Herman A. Brassert, general superintendent of blast furnaces, presented Mr. Field with appropriate resolutions signed by 200 of the department heads of the works and also with a hammered silver service platter. Mr. Field's response was impressive. He concluded: "Some years ago a happy thought occurred to me in working out a monogram. The initials of my name stand for this motto, 'We Are Friends.'"

As a part of the program Mr. Field handed to four other members of his organization diplomas, as is the established custom at "graduation" from the "University of South Chicago." Rudolph Tschentscher, who has been connected with South works for 13 years, latterly as chief electrical engineer, becomes general superintendent of the new steel plant of the Keystone Steel & Wire Company, Peoria, Ill., consisting of open-hearth furnaces and blooming, billet and rod mills. Walter J. Krause of the mechanical department, South works, goes with him as mechanical engineer. Thomas Moore, who has been at South works for 42 years, in charge of the Bessemer department, retires from active service, and David D. Medalie, who has been assistant to Mr. Field, becomes assistant to the president of the Flexo File Company, Chicago. A chest of silver to Mr. Tschentscher, a handsome Colonial clock to Mr. Moore and gold watches to Mr. Krause and Mr. Medalie were the parting gifts.

Mr. Field leaves the Illinois Steel Company to become general manager of the United Alloy Steel Corporation, Canton, Ohio.

An amendment to the Constitution of the United States which would permit the President to approve or disapprove any specific items or provisions contained in any appropriation bill is desired by the Chamber of Commerce of the United States, which has gone on record by a large vote in favor of such an amendment. It appears that in 35 States the people have declared in constitutions that they wish their executive to have the power to veto individual items in appropriation bills.

Fred A. Snow, Kenosha, Wis., will establish a commercial heat-treating plant and will open offices as a consulting metallurgist in Chicago. Mr. Snow has served the Thomas B. Jeffery Company, and its successor, the Nash Motors Company, Kenosha, as chief metallurgist for more than five years.

BRITISH STEEL EXPORTS

December Shipments Lowest in 1916—A Review of the Year—Imports Small

The British Government's efforts to restrict iron and steel exports are meeting with success. The December exports, excluding iron ore and including scrap, were only 158,609 gross tons, the lowest for any month in 1916. The decline was regular in the last four or five months of the year, the high mark having been reached in May with 395,750 tons. The December exports were the lowest for any month in the last three years.

Taking 1916 as a whole the exports exceeded those for 1915 by only a little more than 100,000 tons—3,357,829 tons against 3,248,046 tons. In 1913 they were about 5,000,000 tons, a year of exceptional export trade. The prices realized, however, have surpassed any previous record, the valuation last year having been £56,978,657 against £40,597,294 in 1915. The average value per ton of exports last year was £17 4s. as compared with £12 12s. in 1915 and £10 14s. in 1914.

The pig-iron exports in 1916 were exceedingly large, amounting to 790,065 tons, of which France took over 75 per cent. The average value per ton was £5 18s. as compared with £2 18s. 6d. in 1914 and £3 7s. 6d. in 1913. As to ferromanganese, the statistics show that the United States was credited with 81,600 tons, or over 60 per cent of the total exported, the remainder going almost entirely to the Allied countries. The average value per ton of exported ferroalloys advanced rapidly, having been £21 15s. as against £8 10s. in 1914.

In rails the shrinkage in exports was decided, the total for 1916 having been only 50,275 tons, as compared with 242,267 tons in 1915 and over 500,000 tons in 1913. Steel bars showed a phenomenal increase, the total for 1916 having been 617,159 tons (France taking 519,888 tons) against 489,191 tons in 1915 and about 251,000 tons in 1913.

Imports of iron and steel, excluding iron ore and including scrap, in 1916, were only 872,890 tons as against 1,290,603 tons in 1915. The valuation, however, was considerably higher, having been £11,581,662 last year against £11,173,678 the year previous. Last year 6,900,000 tons of iron ore were imported or about 700,000 tons more than the imports of 1915, which is well up to the average of pre-war years. In 1913 the iron-ore imports were 7,442,000 tons. Imports of pig iron and finished iron and steel continue to decrease. Last year they were only 775,000 tons, the lowest figure for 16 years. In 1915 imports of American billets were 350,000 tons; in 1916 they were 120,000 tons. "So far, however, as manufactured and finished forms are concerned the quantities reaching these shores are still large," says the London *Iron and Coal Trades Review*, "a considerable tonnage of wire rods, wire nails, tubes and fittings, etc., having been imported, almost entirely from the United States."

Milliken Bros. Plant Sold

The steel fabricating plant of Milliken Brothers, Inc., on Staten Island, New York, has been sold, subject to the ratification of terms by the stockholders. It is understood that a shipbuilding company is the buyer, with Wallace Downey, long identified with Staten Island yards, as the moving spirit. A meeting of the stockholders of the Milliken Company is called for Feb. 23 at Richmond, Va., to ratify the sale, and meanwhile a committee of the directors comprising C. McK. Lewis, President Lorenzo C. Dilks and William Barclay Parsons is canvassing the situation as to continuing the business and therefore locating or securing a fabricating shop. It would appear so far that the prevailing sentiment is to perpetuate the Milliken name in the fabricating field, particularly in view of its reputation in different parts of Latin America. Arrangements have been made for several months' full occupation of the Staten Island plant and a more or less indefinite partial use in the future as may be necessary.

The property at Milliken has about 1½ miles of tidewater frontage and covers about 160 acres besides

including 110 acres of surplus real estate. There is \$2,761,000 preferred and \$943,666 common stock outstanding, as well as about \$600,000 ten-year notes. The purchase price, it is stated, will pay for the notes and net a large return on the preferred stock.

Wage Advances and Strikes

The Max Ams Machine Company, Bridgeport, Conn., has been awarded damages to the amount of \$5,000 in a suit against Bridgeport Lodge No. 30, International Association of Machinists; George J. Bowen, its business agent, and William Seemar and Peter J. Coleman, former employees and strikers at the Max Ams factory. The claims for damage were under three heads: 1. The necessity of employing watchmen and constables to protect the factory. 2. The fact that the company was forced to advertise for help in out of town papers. 3. The loss of money by the surrender of contracts for work. The case was tried before a jury which fixed the amount of the damages.

The Iron Molders' Union, Worcester, Mass., has requested an increase in wages of 50c. per day, the present minimum wage of union iron molders being \$3.75 per day. A conference between a committee of four from the union and a committee of four foundrymen resulted in the foundrymen agreeing to give the union representatives an answer not later than Feb. 6.

The Excelsior Needle Company, Torrington, Conn., has made announcement of a plan by which a bonus will be paid at the end of each quarter to employees who remain at work.

A molders' strike seemed imminent in Paterson, N.J., following the wage increases which had been granted in Newark and Elizabeth. The union demanded an advance from \$3.50 per day to \$4, but a compromise was finally effected by which a rate of \$3.75 has been put in force, retroactive to Jan. 1. The Paterson wage is now 25c. below that paid in Newark and 50c. below the Elizabeth scale.

The Weimer Machine Works, Lebanon, Pa., has announced a 10 per cent increase in wages of all employees. The advance was made voluntarily.

To end a strike of employees in the Semet-Solvay Company's plant at Lebanon, Pa., and remove the cause of the crippling of the recently acquired Lebanon and Cornwall iron and steel interests, the Bethlehem Steel Company Jan. 26 took over the Semet-Solvay coke plant at Lebanon. The transfer had been scheduled for Feb. 1. A strike resulted when the Semet-Solvay Company refused to pay the employees a bonus, which the men said had been promised.

The Missouri Malleable Iron Company, East St. Louis, Ill., has announced an increase of 10 per cent in the wages of all its 1200 employees. The announcement was made by superintendent John P. Pero as being due to a recognition of the increased cost of living and also to a recognition of the efforts of the employees in the development of profitable operation of the plant.

The Columbian Iron Works, Chattanooga, Tenn., has granted an 8-hr. day, with a scale of 50c. per hr., to its machinists, and has put its shell manufacturing department on a three-shift basis.

Machinists and molders of the Norton Iron Works, Ashland, Ky., are on strike for shorter hours and increased wages.

The strike of the employees of the Northwest Steel Company, Portland, Ore., has been declared off by the signing of an agreement which provides for open shop, but grants wage increases. As a result, the company has resumed its night shift, and is employing about 500 men. The strike at the Willamette Iron Works is still in force. Both companies are experiencing difficulty in securing materials from the East, and the work has been slowed up on this account.

The Jackson Mills Emery Company, Inc., Easton, Pa., has acquired the business of the Easton Polishing Supply Company. All business will continue to be conducted under the same management. The company handles both abrasive products and polishing supplies.

Pittsburgh and Nearby Districts

At the annual meeting of the Pennsylvania Engineering Works, New Castle, Pa., last week, officers were elected as follows: E. W. Beadel, president and general manager; J. K. Furst, vice-president and chief engineer; C. L. Baldwin, secretary and treasurer, and W. H. Shipler, general superintendent. The company is largely increasing the capacity of several departments of its plant, to take care of an unusually large volume of business for the erection of blast furnaces, metal mixers and other iron and steel works equipment.

The Interstate Commerce Commission has suspended until July 29 the proposed increase of 10 per cent in freight rates on iron and steel articles from Pittsburgh and other Eastern points to the Pacific coast.

The entire six blast furnaces of the Ohio works of the Carnegie Steel Company at Youngstown, Ohio, are now active. No. 5 stack, which was idle for some time, resumed blast last week.

It is stated that the Trumbull Steel Company, Warren, Ohio, has taken some large contracts for tin plate for export to China.

The Empire works, a sheet mill plant of the Brier Hill Steel Company at Niles, Ohio, which has been practically idle for several months, has resumed operations in full. The sheet-mill plant of the Western Reserve Steel Company at Warren, Ohio, taken over several months ago by the Brier Hill Company, has also started up. The Thomas works, a sheet-mill plant of the same company at Niles, is also in full operation for the first time in several months.

The Buckeye Land Company, with a nominal capital of \$50,000, has been organized at Youngstown. This is a subsidiary interest of the Youngstown Sheet & Tube Company, and will control about 300 acres of land recently bought by that company, and which is to be laid out in building lots and to be improved with houses for sale to the employees.

The Marshall Foundry Company, Pittsburgh, has purchased a 10-ton and a 15-ton electric traveling crane to be installed in its ingot mold plant at Josephine, Pa.

Arrangements have been made by which the Westinghouse Electric & Mfg. Company will take over the remaining shares of the Westinghouse Machine Company, about 10 per cent, at \$35 per share cash. A special meeting of stockholders of the Machine Company has been called for March 29 to vote on the proposed sale of the property of the company to the Electric Company.

For several months the natural gas companies at Pittsburgh have been unable to furnish a full supply of gas to manufacturing plants, with the result that many of them are using fuel oil, and prices of the latter have advanced materially. A few weeks ago fuel oil could be bought for 4c. and 4½c. per gal. The price quoted now is close to 6c. per gal., and the refineries decline to make long-time contracts at any price. Wax, another by-product, has been advancing rapidly.

At the annual meeting of the Portage Silica Company, Youngstown, held last week, it was stated that the past year the company produced the equivalent of 5000 carloads of sand, but because of shortage of cars and motive power was able to ship to its customers only about 3500 carloads. Its product is used for sand blast and foundry purposes. Officers were re-elected as follows: J. G. Butler, Jr., president and treasurer; E. E. Klooz, vice-president and general manager; Lee R. Farrell, secretary and sales manager.

The Republic Iron & Steel Company will erect at Youngstown a building to be used as a metallurgical and physical testing laboratory, and another building at its Koppers by-product coke plant for the hospital clerical force and the police in that section of the works.

The Youngstown Foundry & Machine Company held its annual meeting last week, re-electing W. J. Wallis president and general manager; B. G. Parker, secre-

tary and treasurer, and Frank A. Williams, vice-president and manager of sales.

The Whitaker-Glessner Company, Wheeling, W. Va., which will build an 8-mill sheet plant at Beach Bottom, 12 miles from Wheeling, has let contracts for practically the entire equipment. The Foundation Company, New York City, will put in the foundations; the McClintic-Marshall Company, Pittsburgh, will erect the steel buildings; the Wheeling Mold & Foundry Company, Wheeling, will furnish the mills; the Westinghouse Electric & Mfg. Company, East Pittsburgh, will install the electrical equipment; the George J. Hagan Company, Pittsburgh, will build the heating and annealing furnaces; the Falk Company, Milwaukee, Wis., will furnish mill drives, and the Pawling & Harnischfeger Company, Milwaukee, Wis., will install the electric cranes. The mills will be driven electrically. Coal will be used as fuel in the heating and annealing furnaces.

The Youngstown Sheet & Tube Company started last week one of its two Hubbard furnaces, which had been banked for some time for lack of coke. The only furnace in the Mahoning Valley that is now out of blast is the Niles of the Carnegie Steel Company.

At the annual meeting of the Wheeling Mold & Foundry Company held in Wheeling, W. Va., last week, the stockholders voted to increase the capital stock of the company from \$1,000,000 to \$1,500,000. The additional stock is to be preferred, and will be distributed as a dividend. The old board of directors, except two who had resigned, was re-elected. The annual report showed that the company did a volume of business in 1916 totaling approximately \$4,000,000. About \$1,500,000 was shell contracts. The profits for the year were about \$400,000. It was announced that the machinery for manufacturing 6-in. shells, for which the company has no more use, has been sold to a firm in Canada.

The Filler Machine Company, Wheeling, W. Va., has been incorporated with a capital stock of \$5,000 by John B. Bellamy and others. It will manufacture machines for filling liquid and semi-liquid products into containers.

The G. H. Williams Company, Erie, Pa., has been incorporated, with a capital stock of \$200,000, to manufacture machinery, engines, derricks, etc. The incorporators are C. C. and L. A. Williams and G. J. Grierson.

The Carnegie Steel Company is now occupying the office building just finished at its Ohio works, Youngstown. In addition to rooms for the general office force, it contains a large assembly room on the top floor for meetings of employees, two dining rooms for the officials and office staff, rest and lounging rooms and large reception rooms. The building formerly occupied as the offices will be used as a restaurant for the employees.

The Ohio Steel Products Company, Mineral Ridge, Ohio, manufacturer of steel tubing, expects to make large additions to its plant.

Interstate Foundry, Cleveland, Changes Hands

The plant of the Interstate Foundry Company, Cleveland, has been sold by its former owners to entirely new interests composed of Mortimer C. Rosenfield, of the Grabler Mfg. Company, who will be at the head of the company, and several associates. F. B. Whitlock, who has been treasurer and general manager, becomes vice-president and general manager. The new owners propose to enlarge the plant at once, and will double the capacity of the heavy shop devoted to the manufacture of automobile cylinder castings.

The keel of the first vessel to be built at the new plant of the Sun Shipbuilding Company, Chester, Pa., was laid Saturday, Jan. 27—an oil tanker for the Sun Company. The laying of the second keel is expected this week. The main buildings have been completed for nearly two months and the last piece of machinery was installed last week.

Machinery Markets and News of the Works

RAILROADS SHOW INTEREST

Two or Three Western Lines Will Buy

Export Inquiries in Cleveland and New York, but Easier Terms Are Wanted in Latter City

The Chicago and Cincinnati markets report some encouraging activity on the part of railroads, although no great amount of business has been done as yet. Officials of the Chicago, Burlington and Quincy Railroad, which issued a list some weeks ago, were in Cincinnati last week and called on a number of tool builders, but, so far as known, no orders were placed. The Chicago market states that this road has partly revised its list with a view of securing better deliveries. The Santa Fe is inquiring for about 15 tools in Chicago.

In the East the railroads are not showing much interest in tools. Prices seem to be a stumbling block. Several of the roads have apparently lost interest when they learned the figures quoted for certain machines. While they have hesitated, quotations have advanced still further, making action more remote than ever. Makers of various machines have been obliged to advance prices from time to time because of the increasing costs of materials, especially steel castings.

In New York there is evidence that large foreign buyers want easier terms than have prevailed in recent months. Not wanting to make a deposit with its order, a large Italian company has withheld an order for machinery valued at \$250,000.

The trade in Cleveland is figuring on several export inquiries, including 50 machines required for the wheel unit of a Russian automobile factory. English and French inquiries are also in hand.

The expected buying by automobile builders has not started in Detroit, but is expected to materialize at an early day. Lathes are easy to obtain in Detroit, but milling and grinding machines cannot be had for early delivery.

Small-lot buying is holding up well all over the country, and would assume larger proportions were it not for the interruptions to deliveries of materials which follow the shortage of freight cars and locomotives and the consequent congestion.

New York

NEW YORK, Jan. 31, 1917.

Taken as a whole the market shows a continued quieter trend, but a few large deals are pending in both the export and domestic fields. One big export proposition has been halted for a short time by the question of payment, the foreign buyer wanting more lenient terms than have applied to the bulk of war and export buying in recent months; in other words, the buyer is averse to making a substantial payment with the placing of the order. The officials of a leading bank pronounce the buyer to be "as good as gold," but there is, nevertheless, considerable hesitancy in departing from the practice which has been in vogue for two years or longer. That there must be such a departure sooner or later is quite generally admitted. The usual custom has been to require a substantial deposit with the order and the balance on presentation of sight draft against bill of lading.

In New York warehouses are a great many machine tools whose shipment to Sweden is held up by delay in getting

shipping licenses from the British authorities. Cargo space to Sweden is also difficult to secure.

The domestic business is mostly in single tools required in scattered and diversified directions.

The Worthington Pump & Machinery Corporation, Harrison, N. J., has been in the market for a few turret lathes and automatic screw machines.

The General Electric Company, which was a heavy buyer throughout 1916, is in the market for a large number of additional tools.

The Eastern railroads, aside from purchasing an occasional machine of which they are in dire need, are not doing much buying of shop equipment, evidently withholding orders because of prevailing prices. Quotations on several types of machines, particularly those in which steel castings enter largely, have been repeatedly advanced, and in some cases outstanding quotations have been withdrawn. How the railroads will fare eventually is a question, for there is no immediate prospect of lower prices for castings or steel; on the contrary, higher prices are predicted.

The Doeher Die-Casting Company, Court and Ninth Streets, Brooklyn, N. Y., will erect a seven-story factory building, 45 x 100 ft., with a wing 50 ft. square, on the south side of Huntington Street, at an approximate cost of \$150,000.

The Crucible Steel Company of America, Harrison, N. J., has had plans prepared for an open-hearth building and hammer shop, to be erected between Sixth and Seventh streets, at a cost of \$200,000.

The Clemens Electrical Corporation, 725 Main Street, Buffalo, N. Y., incorporated a few months ago with a capital stock of \$10,000 by J. G. Clemens and others, has established a plant for the manufacture of electrical soldering tools, refillable fuse plugs, and alternating current buzzers. L. G. Smith, Farnham, N. Y., is president; J. G. Clemens is vice-president, and L. E. Levee is secretary and treasurer.

The present directors of the Pratt Fork & Hoe Corporation, Frankfort, N. Y., are Charles T. Pratt, F. S. Munger and Richard U. Sherman. This company was incorporated last June with a capital stock of \$1,000,000, and took over the fork and hoe department of the Pratt Chuck Company, Frankfort, of which it is a subsidiary.

The Rochester Ball Bearing Company, Rochester, N. Y., incorporated in August, 1916, with a capital stock of \$5,000, has established a plant at 203 State Street for the manufacture of balls, ball thrust bearings and machinery. Joseph B. Robinson, Barnards, N. Y., is president; Carl M. Weber, 25 Bengel Terrace, Rochester, is vice-president, and George C. Hannemann, 611 Garson Avenue, Rochester, is secretary and treasurer.

The Standard Tool & Mfg. Company, 237 Laurel Avenue, Arlington, N. J., incorporated last October with a capital stock of \$25,000, manufactures tools, dies, universal tool grinders, special machinery. Bernard Keating is president and Frank Keating is vice-president. The interest in the business owned by John Stranberg has been purchased by the other stockholders.

The Vacuum Oil Company, Rochester, N. Y., is preparing plans for a new can factory and a new box factory. It will also reconstruct its boiler house, installing coal-handling equipment. The buildings will cost \$135,000, and \$100,000 will be spent on equipment. The buildings will all be of reinforced concrete. Winfield C. Brower is plant superintendent.

A. Allan & Son, manufacturers of bearing metals, 486 Greenwich Street, New York, has filed plans for the erection of foundry, 50 x 100 ft., at South Fifth and Bergen streets, Harrison, N. J., at a cost of \$15,300. Frederick A. Phelps, Newark, N. J., is the architect, and Frederick K. Kilgus, Inc., Newark, is the contractor. This is the first of three buildings which they will erect on that site.

The business of the Pulsometer Steam Pump Company, Irvington, N. J., in January far exceeded that for any other month in the history of the company.

Additions are to be made to the plant of the Dutchess Foundry Company, 56 Pine Street, Poughkeepsie, N. Y.

The Clark Tool Works, Belmont, N. Y., has been incorporated with a capital stock of \$25,000 to manufacture machine tools, sawing appliances, etc. W. P. and R. E. Clark, Belmont, and J. B. Bradley, Hornell, are the incorporators.

A manufacturing plant is to be established by the DuBois Piston Ring Company, Albany, N. Y., recently incorporated with a capital stock of \$180,000. W. F. Foskett, 22 North Pine Avenue, is manager.

The Titan Tire & Rubber Company, Batavia, N. Y., has been incorporated with a capital stock of \$1,200,000 to manufacture tires, rubber goods, etc. The incorporators are H. D. Newman, 329 West Forty-eighth Street, New York; J. J. Gray, 309 East Seventeenth Street, New York, and J. Gerald, Coatesville, N. J.

The Van Vac Company, Jamestown, N. Y., has been incorporated with a capitalization of \$50,000, to manufacture patented novelties and other articles. Arrangements for a manufacturing plant are being completed. The incorporators are: W. H. Reed, 412 West Third Street; J. Vanstrom and D. L. Carlson.

The Perfection Machine Works, Buffalo, N. Y., has been incorporated by J. E. Harris and E. A. and B. J. Phillips, 314 Fourteenth Street.

The Globe Pattern Works, Buffalo, will build a two-story factory on Henry Street, 50 x 100 ft.

The Upson-Walton Company, Cleveland, Ohio, manufacturer of wire rope and cables, has acquired property on Riverside Avenue, Newark, N. J., as a site for a three-story plant.

The Giese Water Heating Company, Newark, N. J., has been incorporated with a capital of \$100,000 to manufacture water-heating apparatus. C. H. Giese, 142 Market Street, Newark; William G. and M. H. Giese, are the incorporators.

Fire Jan. 24 destroyed a portion of the plant of the General Leather Company, Hoyt Street and Central Avenue, Newark, N. J., with loss estimated at \$35,000. John F. Conroy is president.

The Willard Storage Battery Company, Cleveland, Ohio, has arranged for the construction of a two-story plant, 60 x 100 ft., at 240 Central Avenue, Newark, N. J. The structure will cost about \$14,000.

The Newark Boat Works, Newark, N. J., has been incorporated with a capital of \$125,000 to operate a boat-building plant. J. W. Palmer, H. A. Reeves and W. Haggerty are the incorporators. Registered office, E. H. Paine, 75 Broad Street, Newark, is the company's agent.

Thomas A. Edison, Inc., Orange, N. J., manufacturer of traction machines, storage batteries, etc., has acquired ten acres of land on the Kearny meadows, fronting on the Hackensack River, as a site for a new plant.

The Bayonne Casting Company, Bayonne, N. J., maker of steel and bronze castings, has filed plans for extensions to cost \$10,000.

Fire Jan. 22 destroyed part of the plant of the Lutz Company, manufacturer of drawing instruments and artists' tools, Hudson Boulevard and Twenty-seventh Street, Guttenberg, N. J., with loss of about \$10,000.

The Torsion Balance Company, 147 Eighth Street, Jersey City, N. J., manufacturer of scales and balances, will build a one-story boiler house addition.

The Wheeler Condenser & Engineering Company, Carteret, N. J., manufacturer of steam condensers, pumps, etc., has completed additions to its brass foundry and tubing shop at its plant at Roosevelt. An addition is now being erected to the machine shop, to be completed in about 30 days.

The Red Bank Yacht Works, Red Bank, N. J., has been incorporated with a capital of \$100,000, to manufacture yachts and boats. P. A. Proal, 30 Front Street, Red Bank, and M. M. Proal and E. V. Willis are the incorporators.

Fire Jan. 23 destroyed a building at the plant of the Howe Rubber Company, New Brunswick, N. J., with loss of \$10,000.

Catalogs Wanted

The Mont Color & Chemical Company, Monticello, N. Y., has been formed to produce chemicals, intermediates and dyes from coal tar. Some equipment has been ordered, but further purchases will likely be made in the near future. The company would like to receive catalogs from machinery and other houses.

Baltimore

BALTIMORE, Md., Jan. 29, 1917.

The Maryland Bolt Company has been incorporated with \$25,000 capital stock and has taken over the bolt-making plant of the National Supply Company, Curtis Bay, Md. It is planned to increase the capacity. Mason D. Pratt is president.

The Davison Chemical Company, Curtis Bay, Md., with offices in the Garrett Building, Baltimore, is planning the construction of a machine shop to cost about \$100,000. C. Willard Miller is president.

The S. B. Sexton Stove & Mfg. Company, 501 West Conway Street, Baltimore, will build a one-story brick addition.

The Gulf Refining Company, Pittsburgh, Pa., has acquired a tract of land at Norfolk, Va., and is understood to be planning the construction of a refining plant.

Philadelphia

PHILADELPHIA, Pa., Jan. 29, 1917.

The Camden Iron Works, Camden, N. J., has awarded a contract for the construction of a brick extension to its erecting shop, 48 x 50 ft., 40 ft. high, to facilitate the erection, testing and shipping of its product. It is to be completed about April 1. This is an addition to its present shop, which is 50 x 114 ft. C. C. Reeves, Jr., is superintendent.

The Silvex Company, South Bethlehem, Pa., has moved its executive offices to the Wilbur Trust Company Building. A building with a capacity of 100,000 spark plugs per day will be constructed next summer and will be equipped with the latest type of machinery. It is at present turning out from 10,000 to 15,000 plugs per day.

The Electric Storage Battery Company, Philadelphia, has awarded contract for an eight-story, reinforced-concrete addition to its plant, 120 x 163 ft., to cost \$500,000. The William Steel & Sons Company, 1600 Arch Street, is the contractor.

The Philadelphia & Reading Railroad is asking bids up to Feb. 8, for a new powerhouse, water supply system and 4-ton traveling crane at its yards at Emerald and Richmond streets, Philadelphia. Samuel T. Wagner, Philadelphia, is the architect.

The city of Philadelphia is planning for extensive additions and improvements to its waterworks to cost \$5,250,000. The work will include the following: New emergency pumping station at Lardner's Point to cost \$750,000; new pumping station at Torresdale to cost \$750,000. The Water Bureau is in charge of the work.

The Hess-Bright Mfg. Company, Philadelphia, manufacturer of ball bearings, pulleys, hangers, etc., is having plans prepared for a two-story steel and concrete addition to its plant, 80 x 200 ft.

Lenox, Inc., Mead Street, Trenton, N. J., manufacturer of pottery, is planning for extensive additions in its plant to cost about \$115,000. The proposed additions will consist of a mixing plant, a casting and jigger shop, etc. Walter S. Lenox is president.

Fitzgibbon & Crisp, Inc., Calhoun Street, Trenton, N. J., manufacturer of automobile bodies, has increased its capital from \$100,000 to \$200,000.

Strandwitz & Scott, Camden, N. J., manufacturers of oil guards and tanks, will build a two-story brick and concrete addition to their plant, 60 x 150 ft.

The Victor Talking Machine Company, Camden, N. J., will build a new brick and concrete grinding plant. Ballinger & Perrot, Philadelphia, are the architects.

The North American Motors Company, Pottstown, Pa., is planning to commence the erection of its proposed local plant for the manufacture of gasoline motors within the next month. S. Cary Potter, Pottstown, has been elected vice-president.

The Bethlehem Steel Company, South Bethlehem, Pa., will build a new power plant and coal trestle at its limestone quarries, McAfee, N. J.

The Atlantic Potash Company, recently organized, is reported to have acquired the plant of the Northampton Portland Cement Company, Stockertown, Pa., for a consideration of \$60,000. The company will manufacture fertilizer.

The American Sheet Metal Stamping Corporation, Philadelphia, has been incorporated with a capital stock of \$20,000, to manufacture metal stampings. C. Russel Miller, William E. Vogel, 2464 North Garnet Street, and Herman Pressman, 302 North Broad Street, are the incorporators.

The Fernald-Rush Company, Philadelphia, has been incorporated with a capital stock of \$10,000, to manufacture, install, and repair power plant equipment. The incorporators are: Benjamin G. Fernald, New York City; Ralph M. Rush, Pittsburgh, and N. N. Hackett, Pittsburgh.

The scrap yard of the Joseph Joseph & Brothers Company, at Lebanon, Pa., is to be equipped on strictly modern lines. All machinery for cutting, hauling and conveying scrap will be electrically operated. An electric lifting magnet, which will handle two tons, will be installed.

The Clearfield Machine Shops, Clearfield, Pa., manufacturer of clay-working machinery, is building a small additional foundry for producing its light castings. Its present plant will be devoted to making the larger parts for its heavy clay-working and reduction machinery. The foundry equipment has been purchased. Eventually the entire plant will be removed to the new site. The business is now in process of incorporation. Frank B. Reed, the proprietor, will be president.

New England

BOSTON, MASS., Jan. 29, 1917.

The Driggs Mfg. Corporation, 2605 Equitable Building, New York, has purchased the entire plant and property of the New Haven Mfg. Company which was organized 50 years ago and had capital stock of \$200,000. The new owner will take possession at once and continue the manufacture of marine, automobile and stationary engines, lathes and other machine tools, and ordnance of all descriptions. It is reported that the property will be considerably enlarged. Steps are to be taken to reduce the capitalization to \$100,000. L. L. Driggs is president and treasurer; L. L. Driggs, Jr., is vice-president, and Wesley Zane is secretary.

The General Ordnance Company, Derby, Conn., has plans for plant enlargement costing about \$100,000, which will enable it to triple its present force of employees. Additional land is being acquired for this purpose. The company is producing non-recoil aeroplane guns in four sizes.

The H. & H. Foundry Company, Stamford, Conn., has been incorporated with capital stock of \$20,000. The incorporators are Benjamin Harris, Stamford; John Hansen, East Portchester, and C. Pond Webb, Stamford.

The Adams Coal Machinery Company, New London, Conn., recently incorporated, has been organized with Henry Adams, president, and Nathan Belcher, secretary and treasurer.

The Windsor, Conn., plant of the General Electric Company has begun working a night shift in order to keep up with orders.

The Seifert Special Machine Company, Hartford, Conn., has been organized with M. A. Thorpe, president; Thomas E. Canfield, vice-president, Edward T. Canfield, secretary and treasurer. It starts with \$50,000 capital paid in.

The Graton & Knight Mfg. Company, Worcester, Mass., has voted to increase its capital stock from \$2,000,000 to \$2,500,000. The officers of the company, Walter M. Spaulding, president and general manager; George T. Dewey, vice-president, and Frank H. Willard, assistant general manager, were re-elected.

The Bridgeport Iron & Metal Company, Bridgeport, Conn., has been organized with \$10,000 paid in capital. William Olderman is president; A. Olderman, secretary, and Phillip Nowitz, treasurer.

The Vulcan Iron Works, New Britain, Conn., has awarded a contract for an addition, 40 x 50 ft., one story.

The Standard Mfg. Company, Bridgeport, Conn., has issued 1500 additional shares of capital stock of a par value of \$100.

The New London Ship & Engine Works, New London, Conn., is to commence shortly to erect a large forge shop, according to press reports.

The Wright Wire Company, Worcester, Mass., is to build two additions to its plant at Palmer, Mass., one 70 x 200 ft., two stories, for a rod mill; the other, 80 x 184 ft., one story, for a drying, cleaning and annealing house. The company is laying additional railroad tracks and has bought a locomotive for its own use. The new buildings will increase the output about 40 tons per day.

The Gile Motor Company, Boston, Mass., has been incorporated with capital stock of \$500,000. The directors are C. H. Hutchinson, president; Herbert A. Palmer, 50 Congress Street, Boston, treasurer, and Joseph F. Warren.

The Industrial Laboratories Corporation, Boston, Mass., has been incorporated with a capital stock of \$450,000 to manufacture thermostats. The directors are Robert Cushman, president; Charles D. Woodberry, 95 Milk Street, Boston, treasurer, and S. B. Montgomery.

The Dover McDevitt Company, Providence, R. I., has been incorporated with a capital stock of \$25,000 to manufacture tools, machines, etc. The incorporators are George W. Dover, John M. McDevitt and John E. Canning, all of Providence.

The Resilia Company, Boston, Mass., has been incorporated with a capital stock of \$200,000 to manufacture metal devices. The directors are Frank D. Wilde, president; Oliver E. Chapman, Sharon, treasurer, and M. E. Zink.

The John W. Lockerbie Company, Boston, Mass., has been incorporated with a capital stock of \$12,000. The directors are John W. Lockerbie, Marblehead, president and treasurer; E. W. Lovett and E. F. Ely. It will manufacture electrical appliances.

The New England Brass & Fixture Company, Boston, Mass., has been incorporated with a capital stock of \$25,000. The directors are Gabriel B. Levy, 125 Pearl Street, Boston, president and treasurer; E. R. Harris and H. W. Sexton.

The American Fastener Company, Waterbury, Conn., has

secured a permit for a factory building, 40 x 98 ft., three stories, and a one-story addition, 25 x 58 ft.

The Colonial Brass Company, Middleboro, Mass., has purchased a tract of land and contemplates the erection of a factory. The details have not been decided upon.

The Universal Boring Machine Company, Hudson, Mass., has begun the construction of an addition, 40 x 60 ft., three stories.

The Continental Wood Screw Company, 13 Hamilton Street, New Bedford, Mass., has awarded contract for a factory building, 40 x 260 ft., two stories, and a boiler house, 28 x 30 ft.

The Bela Body Company, Framingham, Mass., is receiving bids for an addition, 100 x 150 ft., one story.

Chicago

CHICAGO, ILL., Jan. 27, 1917.

To the list of machine tools previously issued by Western railroads has been added the inquiry of the Santa Fe for 15 general-purpose tools, against which local dealers are now submitting figures. The Chicago, Burlington & Quincy has made some revisions in its original lists, apparently in the interest of better deliveries, and is expected to close for its requirements in a few days. The general inquiry from the manufacturing trade is well sustained and sales of individual tools are in good volume.

The Smith Motor Truck Corporation, the organization which has become well known as the Smith-Form-A-Truck Company, has grown so rapidly as to require additional manufacturing facilities doubling its capacity, and at Clearing, Ill., where its present plant is located, a new building, 162 x 270 ft., two stories, is to be erected at a cost of \$95,000. The present plant of the company has a capacity of 11,500 trucks per year, while with the new equipment a minimum of 30,000 trucks is contemplated.

The Champion Foundry & Machine Company, Chicago, has been organized with a capital of \$40,000 by E. L. Kremer, attorney, 7 South Dearborn Street, A. E. Nelson and S. C. Larson.

The Powell Steel Kitchen Company, Chicago, has filed application for a charter with an authorized capital of \$50,000, the incorporators being Theodore Bachmeister, Jr., William H. Bozell and Milton C. Powell, 5464 Woodlawn Avenue.

The Ryan Car Company, 332 South Michigan Avenue, Chicago, with a plant at Hegewisch, Ill., will build a new car shop for the manufacture of steel cars, at a cost of approximately \$350,000. A site of 50 acres has been purchased and it is expected that the work of construction will be undertaken in the early spring.

The Diamond T Motor Company, Chicago, builder of motor trucks, has contracted for the building of a manufacturing plant to be located in Kilbourne Avenue to cost \$1,000,000. C. A. Tilt is president and treasurer.

The Turner Mfg. Company, Chicago, maker of picture frames, has purchased an entire block abutting on the Chicago, Burlington & Quincy Railroad, on which new manufacturing buildings will be erected.

The Sanitary District of Chicago, 910 South Michigan Avenue, Chicago, Charles H. Sergel, president, proposes to erect a hydroelectric power station near Joliet, Ill., to have capacity of 28,000 hp., and to cost about \$5,000,000. D. W. Morrison is the mechanical engineer.

Morris, Wood & Son, 5108 West Lake Street, Chicago, manufacturers of tools, machinery and castings, are about to build an addition, 36 x 40 ft., two stories, to cost \$8,000.

The William D. Gibson Company, Chicago, manufacturer of steel springs, is having plans prepared for a two-story shop, 55 x 220 ft., estimated to cost \$90,000.

Charles L. Anderson, Chicago, machinist, has had contracts let for a two-story machine shop, 50 x 125 ft., of mill construction, at Walnut Street and Oakley Avenue, to cost \$16,000.

The Valentine-Seaver Company, furniture manufacturer, 1721 Sedgwick Street, Chicago, suffered a heavy loss from fire which also damaged the automobile and wagon repair shop of W. R. Banes, adjoining. The aggregate loss is estimated at \$75,000.

The Chicago Scale Company, Waukegan, Ill., has taken out a permit for the extension of its plant in the form of a two-story building, 60 x 100 ft. The company operates a machine shop and is a manufacturer of small motors.

Bids are being received for the construction of the additions to the Rock Island Arsenal, for which an expenditure of \$750,000 is contemplated.

The Accessory Mfg. Company, 693 Raymond Avenue, St.

Paul, Minn., recently incorporated by J. F. Paterson and John Boyle to manufacture automobile rims and other accessories, will build a factory to cost \$50,000.

Stranger & Johnson, manufacturers of sheet-metal and cast iron and barn specialties and fixtures, Atlantic, Iowa, plans to install a foundry this year. Last summer it completed an addition to its factory, 50 x 140 ft., and it will probably build another this coming year. Its business has increased 14 per cent over 1916 and has necessitated the additional floor space and equipment. W. E. Johnson is secretary.

The Job Plant Company, Marshalltown, Iowa, which is erecting a two-story foundry addition, will also erect another ell-shaped building, 60 x 90 ft., of brick, one story, to which it will remove the grinding and fitting department, using the old building for storage. The foundry addition will double its present capacity, and the grinding and fitting addition will greatly enlarge the facilities in that department.

The A. H. Averill Machinery Company, Portland, Ore., has purchased a site of 14 acres on which it will build a plant for the assembly and manufacture of saw mill, threshing and tractor machinery. A. H. Averill is president.

Frank D. Chase, architect and engineer, Peoples Gas Building, Chicago, Ill., will take bids the first of next week on a three-story machine shop addition to the plant of the Link-Belt Company, Chicago. It will be 125 x 175 ft., of heavy construction, including crane runway, etc.

Cleveland

CLEVELAND, OHIO, Jan. 29, 1917.

The demand for machine tools is more active. Dealers report a fair volume of business in single standard machines and in small lots. An inquiry is out for 25 to 30 machines and another for 16 machines, the latter mostly for larger-sized tools. Among prospective foreign business is an inquiry from Russia for about 50 machines for the wheel unit of an automobile plant, including facing, riveting, boring and truing machines. England and France are inquiring for lathes, grinding and other machine tools. Deliveries on turret lathes and screw machines have improved considerably and shipments on most sizes can now be secured from six weeks to three months.

The Swander Brass Mfg. Company, Cleveland, has been incorporated with a capital stock of \$40,000 to manufacture plumbers' brass goods. Herman Swander will be president. A factory building will either be leased or erected.

The K. D. Carburetor Company, Cleveland, has been reorganized with an increase in capital stock of \$275,000. It has acquired the plant of the Atlas Bolt & Screw Company on Marquette Avenue, into which it will move as soon as the latter company is settled in its new plant on Ivanhoe Road. The Carburetor Company states that it has arranged for all additional equipment.

The Harris Automatic Press Company, Niles, Ohio, which will move its plant to Cleveland, has placed a contract with the Walther Engineering Company for a factory, 100 x 500 ft.

The Euclid Crane & Hoist Company, Euclid, Ohio, has acquired a 4-acre factory site but announces that it has no plans for the erection of a new plant.

The Falls Engineering & Machine Company, Cuyahoga Falls, Ohio, has been incorporated with a capital stock of \$15,000 by G. H. Herdman and others.

The Meyer Rubber Company, Massillon, Ohio, will shortly begin the erection of a new plant.

The Buckeye Jack Mfg. Company, Alliance, Ohio, has increased its capital stock from \$50,000 to \$100,000 and contemplates extensions to its plant and equipment.

The Seneca Wire & Mfg. Company, Fostoria, Ohio, will install a sprinkler equipment and probably build a new power plant. The company reports that its business has increased more than 75 per cent the past year, and with additions under way its capacity will be more than doubled.

The Hinde & Dauch Paper Company, Sandusky, Ohio, will erect a four-story factory addition and install considerable machinery.

The O. C. Barber Mining & Fertilizer Company, has let preliminary contracts for its new lime and fertilizer plant to be erected at Howenstein, Ohio.

The Crowley Mold Company, Marion, Ohio, has been incorporated with a capital stock of \$15,000 by John F. Crowley and others to manufacture cast-iron molds for making cement blocks.

The Flexible Side Car Company, Loudenville, Ohio, has moved into a new plant, 225 x 1000 ft.

The Brass Specialty Mfg. Company, Mansfield, Ohio, is the name of a new company being formed with a capital stock of

\$30,000. It will erect a building, 75 x 100 ft., one story, to include a machine shop.

The Taylor Coupler & Steel Casting Company, Toledo, Ohio, has been incorporated with a capital stock of \$100,000 by John C. Taylor and others.

The Thurston Range & Heating Company, Thurston, Ohio, plans to build a plant for the manufacture of ranges and furnaces.

The American Sewer Pipe Company, Akron, Ohio, which is planning the erection of a branch plant, will erect it at Toronto, Ohio, not Toronto, Canada, as stated in THE IRON AGE of Jan. 18.

Milwaukee

MILWAUKEE, WIS., Jan. 29, 1917.

Local machine-tool builders have not discerned any appreciable let-up in the insistent demand, but the largest problem still is to make deliveries. No relief is noted in the acute car shortage and shipments continue to be badly hampered. Companies dependent upon outside sources for raw materials and other supplies have much difficulty in getting shipments this way. Orders are being booked at a rapid rate, however, and every shop is sold up for many months ahead. The absence of large-lot buying is directly attributable to the disinclination of metal-working companies to undertake further extensions because of the enormous cost of building materials. The same condition also delays the entrance into the field of a number of new companies.

The Ajax Frog & Switch Company, Blue Island, Ill., will break ground about March 15 for its proposed new plant at Superior, Wis. Plans are being drawn by E. S. Radcliffe, architect, for a main shop, one-story, 200 x 240 ft.; a power house, 35 x 36 ft., and an office building, 24 x 60 ft. The estimated cost is in excess of \$100,000. Between 75 and 100 operatives will be employed at the start.

W. M. Anderson, 1920 Winter Street, Superior, Wis., has opened a garage and repair shop and will install several additional machine-tools and other equipment.

The Marathon Paper Mills Company, Rothschild, Wis., has commissioned Vaughan & Meyer, electrical engineers, Milwaukee, to design a new power plant, which will require two 400-hp. boilers, automatic stokers, feed pump, heater and auxiliary equipment.

The Overland-Wausau Company, Wausau, Wis., is preparing to build a garage, warehouse, service station and repairshop of brick and concrete, 60 x 120 ft., three stories and basement, to cost \$36,000. H. G. Liebert, Wausau, is the architect, and will take bids after Feb. 20.

O. H. Harrington, Waupaca, Wis., has leased the machine shop of Wagner Brothers, Burlington, Wis., commencing March 1, for a garage and machine shop.

The Kohler Company, Kohler, Wis., manufacturer of plumbers' goods and sanitary ware, is erecting a two-story brick building, 81 x 210 ft., to be ready March 1. Most of the additional space will be used for the packing and shipping department. Walter J. Kohler is general manager.

The Auto Sales Company, Milwaukee, has engaged Juul & Sixta, architects, Sheboygan, Wis., to prepare plans for a three-story garage and service building, 60 x 120 ft.

The Beijer Hydraulic Transmission Company, Stevens Point, Wis., has completed several demonstration models and is preparing to engage quarters for manufacturing the appliance for automobiles, trucks, tractors, elevators, motor boats, etc. The capital stock is \$50,000. Arthur Beijer is general manager.

The Martin Paper Coating Company, Chicago, manufacturer of waxed paper, will build a new plant in West Allis in the spring.

The Atlas Metal Parts Company, Milwaukee, is the new style of the Brenckle-Anger Company, 997 Fifteenth Street, manufacturing patented box locks and hinges.

The Chicago & North-Western Railroad Company has announced plans for a new machine shop, boiler house and roundhouse at Madison, Wis.

The Turner Mfg. Company, Port Washington, Wis., maker of gasoline engines and farm machinery, is engaging in the manufacture of farm tractors, the first of which have been completed. Large orders are being booked and an initial issue of at least 500 machines is planned.

The Peninsula Automobile Company, Sturgeon Bay, Wis., has changed its name to the Peninsula Company and will extend its scope to include a complete machine shop business. Orders for equipment will be placed at once.

Olaf Enger, Chippewa Falls, Wis., has leased the main building formerly occupied by the Bloomer Machine Works and will open a general machine shop. Considerable new equipment will be required.

The Jersild Fire Escape Company, Waupaca, Wis., is completing the work of equipping its plant and expects to be able to start operations on Feb. 1. In the meantime current orders are being executed under contract with other companies in central Wisconsin.

C. F. Kimball, Racine, Wis., has opened a machine shop at 611-613 Seventh Street and will specialize in automobile repairs.

Schnetzky & Son, architects, Milwaukee, will take bids after Feb. 1 for the erection of a one-story garage and repair shop, 60 x 120 ft. The name of the owner and location are withheld for the present.

The Northern Industrial Corporation, Green Bay, Wis., has been organized by merchants and manufacturers to organize, finance and locate new industries in that city. The company is raising a subscription fund of \$175,000 at this time to induce the Menominee Motor Truck Company, Menominee, Mich., to move to Green Bay. Most of the money already has been raised. John M. Dee is in charge.

F. W. Andree, architect, Milwaukee, is preparing plans for a two-story garage and repair shop, 50 x 100 ft., costing \$20,000, to be erected at Oshkosh, Wis. Bids will be taken after Feb. 20.

The Bukolt Tire Protector Company, Stevens Point, Wis., is perfecting its organization with a capital stock of \$200,000 and will purchase equipment for the manufacture of steel automobile tire protectors and tire tools. It will occupy the former plant of the Automatic Cradle Mfg. Company. Operations will begin about May 1. John J. Bukolt is president.

Detroit

DETROIT, MICH., Jan. 29, 1917.

Dealers expect that the machine-tool market, which has been slow the past week, will improve after the Chicago Automobile show, when motor car companies are expected to order considerable new equipment to take care of a production which will far exceed that of any previous year. Small orders have kept the market firm. The freight congestion, together with the embargo placed against Detroit on all goods except perishable and coal through the Toledo gateway, has helped to decrease orders. Deliveries on lathes have eased up noticeably, but considerable trouble is experienced in getting milling and grinding machines, which require several months for delivery.

The Harroun Motor Company has ordered practically all of the equipment for its new plant at Wayne, Mich.

The Magic Wax Company, Detroit, manufacturer of dyes and colors, has leased the five-story building at 29-33 West Woodbridge Street, and will move into it shortly.

The American Motor Truck Company, manufacturer of motor trucks and incorporated for \$600,000, will begin work, within 30 days on a plant in southwestern Detroit on the Michigan Central tracks.

The Wolverine Car & Tractor Company, whose temporary assembling plant is located at Wayne, Mich., is looking for a location for a permanent factory. William G. Wagenhals is president.

The Detroit Brass Works has increased its capital stock from \$400,000 to \$500,000.

The F. B. Regulator Company, Benton Harbor, Mich., has been incorporated by B. S. Barnes, E. M. Brown and C. P. Johnson to manufacture automobiles and accessories.

The Page Brothers Buggy Company, maker of automobile tops, Marshall, Mich., is planning to increase its output.

The Auto Specialty Company, St. Joseph, Mich., will begin operation Feb. 1. About 300 men will be brought from Joliet, Ill.

The J. W. Murray Mfg. Company, Detroit, has increased its capital stock from \$500,000 to \$1,000,000.

The Sparks-Withington Company, Jackson, Mich., manufacturer of the Sparton automobile horn and automobile parts, has built an addition which will double the capacity of its plant. A portion of the new factory will be devoted to the manufacture of the Sparton vacuum gasoline system, and the remainder to making motor horns, radiators and fans.

The Detroit Valve & Fittings Company, manufacturer of malleable iron fittings, carburetors and automobile parts, Wyandotte, Mich., is enlarging its plant by an addition half the size of its present factory. E. B. Whitcomb is president. Its capital stock has been increased from \$500,000 to \$1,500,000.

The Detroit Gauge & Metal Stamping Company, Detroit, has been incorporated for \$50,000 by Oliver S. Kelley, Saboner Livingstone and Edwin C. Lewis, Detroit.

The Chicago Stove & Range Company has been incorporated for \$150,000 at Benton Harbor, Mich.

The Redden Truck Maker, recently taken over by a corporation capitalized at more than \$1,000,000, will begin manufacturing in the plant of the Briscoe Automobile Company, Jackson, Mich. Additions will be made to the Jackson plant.

The Standard Tool & Mfg. Company, Detroit, has increased its capitalization from \$35,000 to \$100,000.

The Allen & Curtis Company, manufacturer of adjustable boring tools, has removed from Mishawaka, Ind., to Benton Harbor, Mich., where it will be under the supervision of B. M. Nowlen of the Nowlen Lumber Company. A scarcity of mechanics due to the presence of many large shops in Mishawaka was the prime cause for the company's moving. Its new plant will give better facilities for handling its work.

The Hackett Motor Car Company, Jackson, Mich., is preparing plans for a new factory in Grand Rapids, Mich., to be completed in the spring.

The Clover Foundry Company, Muskegon, Mich., has been organized with a capital of \$50,000 by Charles S. Charles M. and Harvey W. Clover.

Cincinnati

CINCINNATI, OHIO, Jan. 29, 1917.

Officials of the Chicago, Burlington & Quincy Railroad Company visited local machine shops last week, but as far as is known, no orders were placed on a list of machine tools issued several weeks ago. It is known that the Santa Fe will soon ask for estimates on quite a lot of shop equipment. The New Orleans & Northeastern will also install a number of machine tools in its shops at Meridian, Miss. The demand from automobile and auto-truck builders is holding up fairly well, but buying from this source is mainly confined to single tools. The steel mills are also purchasing on the same plan, but the total number of orders received makes a very encouraging average. As far as can be ascertained, none of the lathes wanted for Russia has been bought, the delivery date being the stumbling block in placing the business.

The demand for woodworking equipment has improved. The boiler and tank business is a trifle slower. The present cost of plates and heavy sheets is one reason given for the let-up. All makers of internal combustion engines are very busy.

The smoke prevention campaign now under way by different cities in this vicinity has brought out a heavy demand for automatic stokers. It is reported that in Dayton, Ohio, in the past 30 days, permits for the installation of over 20 stokers were taken out.

The Tower Mfg. Company, Cincinnati, W. F. Robertson president, has purchased the plant of the Johnson Cordage Company, Madison, Ind., which has been under lease by the Tower Company since its recent fire. Additional tack-making machines and other special equipment will be required.

The Champion Tool Works Company, Cincinnati, V. H. Kreusberg, president, has decided to go ahead in the construction of its new plant at Winton Place. Zettel & Rapp, architects, are drawing up plans for the building that will contain approximately 45,000 sq. ft. of floor space.

The United States Playing Card Company, Norwood, Ohio, has had plans prepared for an addition to its plant that will be 60 x 110 ft., two stories, of reinforced concrete.

The Globe Folding Box Company, Cincinnati, intends to move to Winton Place, and is having plans prepared for a large factory. Only special equipment will be required.

The Sterling Machine Tool Company, Third and Vine Streets, Cincinnati, has been incorporated with \$10,000 capital stock by Claire H. Norton and others.

The Queen City Ice Rink Company, Cincinnati, will soon be incorporated to build an ice-skating rink. F. H. Chaffield is one of the incorporators.

The American Railways Equipment Company, Dayton, Ohio, recently organized, contemplates building a plant for the manufacture of car registers. E. L. Reed, Rebold Building, is one of the incorporators of the company, whose capital stock is placed at \$100,000.

The Joyce-Cridland Company, Dayton, Ohio, maker of track and car jacks, hoisting equipment, etc., has been purchased by W. F. Bippus and J. M. Switzer, who will increase the capacity of the present plant. The company's old name will be retained.

The Seybold Machine Company, Dayton, Ohio, has acquired additional property adjoining its plant and plans an extensive addition to be erected the present year.

The new factory of the McIntyre Mfg. Company, Columbus, Ohio, recently mentioned as contemplated, will be 100 x 200 ft., one and two stories, of mill construction.

The Standard Bolt & Forging Company, Columbus, Ohio, expects to have the new addition to its plant completed in time to install the necessary equipment before June 1 next.

The North Columbus Ice Company, Columbus, Ohio, has completed the new addition to its plant. All equipment has been purchased.

The J. C. Greendyke Company, Miamisburg, Ohio, has tentative plans under way for a large addition to its cordage and twine plant.

The Krein Chain Company, Wapakoneta, Ohio, will install additional equipment at an early date sufficient to nearly double the output of its plant.

The Marietta Mantel Company, Marietta, Ohio, has increased its capital stock from \$50,000 to \$100,000, and will double the capacity of its plant at an early date.

The Federal Chemical Company, Louisville, Ky., is stated to have purchased a large tract at Columbus, Ohio, on which will be erected a chemical plant to cost \$125,000.

The Rivet Cutting Gun Company, 220 East Second Street, Cincinnati, has been organized to manufacture a rivet head cutting machine. J. M. Crowe is vice-president and general manager. No extra equipment will be required at the present time.

Indianapolis

INDIANAPOLIS, IND., Jan. 29, 1917.

The Farmers & Merchants Light & Power Company, Mongo, Ind., has applied for permission to issue \$500,000 capital stock to purchase and improve five dams and water-power plants on the St. Joseph and Fawn rivers in northern Indiana and southern Michigan. The improvements and development of electrical energy will cost \$278,250.

The Capital Truck Company, Indianapolis, has been incorporated with \$10,000 capital stock to manufacture automobiles, trucks and tractors. The directors are Charles A. Edmonson, Paul W. McElroy and Arthur O. Stanley.

The Simplicity Incubator Company, Indianapolis, has been incorporated with \$20,000 capital stock to manufacture incubators. The directors are J. L. Clough, C. H. Weyl and V. C. Getz.

The National Automatic Tool Works, Richmond, Ind., is building a factory and office.

The Princeton Utilities Company, Princeton, Ind., has been incorporated with \$50,000 capital stock to manufacture farm machinery. The directors are William P. Abell, Robert Heriot and George E. Daugherty.

The Cardinal Cabinet Company, Wabash, Ind., has increased its capital stock from \$80,000 to \$100,000.

The Henry Airtight Weather Strip Company, Crawfordsville, Ind., has been incorporated with \$10,000 capital stock to manufacture weather strips, etc. The directors are J. W. Henry, J. D. Druschel and T. E. Ballard.

The Acme Blackboard Company, Laporte, Ind., has been incorporated with \$10,000 capital stock. The directors are John W. and Harry L. Bryant and John A. Ridgeway.

The Sand-Lime Brick Company, Greenfield, Ind., has been incorporated with \$60,000 capital stock by Ernest L. Dobbins, Samuel D. Clayton and Charles L. Tyndall.

The Bimel Spoke & Auto Wheel Company, Portland, Ind., has increased its capital stock by issuing \$50,000 preferred.

The Allmure Mfg. Company, Marion, Ind., has been incorporated with \$25,000 capital stock to manufacture electrical household appliances. The directors are J. W. Phillips, R. L. Straughn and L. L. Clifford.

The Electric Light & Power Company, Ferdinand, Ind., has been incorporated with \$10,000 capital stock. The directors are William R. Sauer, John P. Reinacker and Richard Eiberg.

The Curtis-Park Mfg. Company, Indianapolis, has been incorporated with \$50,000 capital stock to manufacture metal products. The directors are Isaac R. Curtis, W. B. Flick and G. T. Allen.

Loshbaugh & Jordan, machinists, South Bend, Ind., are planning a one-story extension to their plant, 80 x 200 ft., to cost \$20,000.

The Franklin Mfg. Company, Franklin, Ind., has been incorporated with a capital stock of \$15,000 to manufacture furniture. Guy Fulton, Dudley A. Cox and Joseph J. Doan are the incorporators.

The Hopkins Fertilizer Company, New Albany, Ind., has increased its capital from \$50,000 to \$150,000 and proposes extensive extensions. R. C. Ellis is manager.

The Central South

LOUISVILLE, KY., Jan. 29, 1917.

Activity is increasing in the Kentucky oil fields, and refinery projects are taking definite shape. Coal development work in eastern and southeastern Kentucky is continuous. A somewhat easier car and coal situation is noted, although a good deal of a stringency still exists. The Louisville & Nashville Railroad is stated to be reverting to wooden construction for coal cars, being unable to get deliveries on steel, while all over the State concrete is being preferred to steel wherever it can be used for bridge construction.

C. H. Moores, president Warehouse Architectural & Engineers Company, Chicago, has announced plans for the construction of a terminal warehouse in Louisville to cost \$2,500,000. It is to be equipped with electrical elevator and transportation equipment and will provide for manufacturing plants. A reinforced concrete structure with 1,500,000 sq. ft. of floor space is projected.

Mobley & Mobley, Elizabethtown, Ky., will build a garage 52 x 100 ft., proposing to equip for service and repair work.

The Harlan Ice Refrigerating Company, Harlan, Ky., has been incorporated with capital stock of \$10,000 by Joe Ross, Hiram H. Owens and James D. Black, all of Barbourville, Ky. A 15-ton plant is projected.

The Anglo-American Mill Company, Owensboro, Ky., manufacturer of flouring mills, has increased its capital stock from \$500,000 to \$650,000.

The Paducah Ice Mfg. Company, Paducah, Ky., has been incorporated with capital stock of \$100,000 and takes over the property of the old Paducah Ice Company, which will be improved. The incorporators are J. D. Mocquot, Sydney Loeb and Jesse Loeb.

A chair-making plant to cost \$8,000 is to be established in the Stuart-Robinson School at Blackey, Ky. T. V. Tadlock is principal.

The Burdette Mfg. Company, Chattanooga, Tenn., will equip a plant at Alton Park, Tenn., for manufacture of hydrogen and oxygen.

Fire destroyed the transformer house and equipment of the Tennessee Power Company at Mascot, Tenn., with a loss of \$25,000. The American Zinc Company's local plant was supplied from that station and remains inactive until replacements are completed.

The Chattanooga Mfg. Company, Chattanooga, Tenn., will rebuild its box factory recently destroyed by fire with a loss of \$30,000. It proposes increasing its capital from \$50,000 to \$150,000 and re-equipping on a largely increased scale. H. C. Piper is secretary and superintendent.

The Louisville & Nashville Railroad has given a contract for the construction of an automatic reinforced concrete locomotive coaling plant to be erected at Paris, Tenn., to the Roberts & Schaefer Company.

The William J. Oliver Mfg. Company, Knoxville, Tenn., is considering a proposal of Nashville interests to remove its plow and tractor manufacturing departments to Nashville.

Birmingham

BIRMINGHAM, ALA., Jan. 29, 1917.

Southern foundries remain quite busy and coal-mining development is on a large scale. Both steam and electrical supplies are active. The outlook for spring trade is quite good.

The Central Foundry Company, Bessemer, will erect immediately a 40-ton floor foundry adjoining its present buildings.

The Southern Refractories Company, controlled by the Pennsylvania & Kentucky Fire Brick Company of Bolivar, Pa., will be organized with a capital stock of \$150,000. It has acquired plants at Mission Ridge, Ga., and Fort Payne, Ala. The latter place will be its Southern headquarters.

The Textile Specialty Company, Belton, S. C., incorporated with a capital stock of \$150,000, has purchased the Cox foundry and will manufacture adjustable bearings, etc., for cotton-spinning frames. S. H. McGee is president.

The Southern Munitions Company, Anniston, Ala., has been incorporated with a capital stock of \$3,000 to manufacture metal products, etc. Walter M. Hood, C. A. Bingham and W. M. Loringall of Birmingham are the incorporators.

Texas

AUSTIN, TEX., Jan. 29, 1917.

The machine-tool market has improved the past week. Many inquiries are being received from prospective purchasers of irrigation machinery. Spring planting has begun in the more southern part of the State.

The Gulf, Colorado & Santa Fé Railroad will install a pumping plant at Caldwell.

The Crystal Oil Company, Houston, will build a new refinery with a daily capacity of 60,000 bbl. at a cost of about \$2,600,000. It will also lay a pipe line to connect the refinery with the mid-continent oil fields at an estimated cost of \$5,000,000.

The Texas Company, Houston, is building a pipe line from the Healdton field in Oklahoma to Sherman, which will involve the installation of one or more pumping plants.

St. Louis

ST. LOUIS, Mo., Jan. 29, 1917.

The machine-tool business showed an increase of activity the past week. The aggregate for the week, both of inquiries and sales, was reported the best since the December slackening made itself apparent. Transactions still continue on single tools, rather than from the issue of lists, owing to deliveries.

The Mid-Nation Iron Products Company, St. Louis, has been incorporated with a capital stock of \$2,000,000 by Earl A. Clemons, W. R. Leeper and William C. Groetzinger, Chicago; A. F. Olson, St. Paul; Joseph W. and E. A. Lindsay and Frank J. Quinn, St. Louis. Plans of operation are withheld.

The Missouri Plate Glass Company, St. Louis, has been incorporated with a capital stock of \$1,500,000 by George D. DeBuchanan and Richard Francis of Herculaneum; H. A. and R. R. Baumann and C. B. Johnson to consolidate and operate plate glass plants at Crystal City and Valley Park, Mo., to extend capacity.

The Murphy Machinery & Equipment Company, St. Louis, has acquired a building for the assembling and handling of heavy tractors, and other machinery.

The Maxwell Motor Sales Corporation, Detroit, Mich., has acquired a building in St. Louis with 30,000 sq. ft. of floor space for the assembling of motor cars. A branch factory will also be established.

The Walls Frogless Switch & Mfg. Company, Pueblo, Col., which is erecting a branch plant at Kansas City, Mo., at a cost of \$100,000, has put this work in charge of J. W. Walls, general manager, and J. P. McHale, sales manager, who have opened an office at 1112 Waldheim Building, Kansas City. This office is in the market for a traveling crane, lathes, drills, power hammer and steel-cutting saws.

The Combination Auto-Lock Company, St. Louis, has been incorporated with a capital stock of \$20,000 by W. B. Baltazar, George A. Abel and others to manufacture locks.

The Reichel Motor Company, Macon, Mo., has been incorporated with a capital stock of \$40,000 by Theodore Reichel, D. W. Acuff and John W. Hatton.

The Macon Motor Company, Macon, Mo., has increased its capital stock from \$2,000 to \$600,000 for improvements to its plant.

The White Fluid Motor Company, Kansas City, Mo., has been incorporated with a capital stock of \$50,000 by Thomas A. White, Z. D. Brown and Irvin A. Strauss.

The Butler Mfg. Company, 1324 Grand Avenue, Kansas City, Mo., manufacturer of steel barrels, etc., has increased its capital stock from \$330,000 to \$430,000.

The DeKalb Light & Power Company, DeKalb, Mo., has been incorporated with a capital stock of \$16,500 by R. D. Reed, William Call and H. L. Graves.

The Doe Run Lead Company, River Mines, Mo., will install two 3000-kw. steam turbines, seven 500-hp. boilers and other equipment. Viele, Blackwell & Buck, 49 Wall Street, New York, are the consulting engineers.

The Belleville Enameling Works, Belleville, Ill., has been incorporated with a capital stock of \$12,000 by E. A. Settler, Wilbur E. Kiebs, and others.

The Quinn Sheet Metal Works, Joliet, Ill., has increased its capital by \$10,000 and will buy new mechanical equipment.

The Marianna Cotton Compress Company, Marianna, Ark., has increased its capital by \$10,000 to buy new equipment.

The Arkansas-Oklahoma Ice Company, Russellville, Ark., will install equipment for a 400-ton cold-storage plant.

The Little Rock Lumber Mfg. Company's plant at Little Rock, Ark., has been burned with a loss of \$50,000.

The Hominy Cotton Oil Company, Hominy, Okla., has been incorporated with a capital stock of \$30,000 by W. S. Crow, F. G. and R. C. Drummond.

Kaw City, Okla., will equip an electric light and power plant to cost about \$25,000, developing about 75 hp. About \$10,000 worth of machinery is wanted. The Benham Engineering Company, Oklahoma City, is in charge.

The Sapulpa Refining Company, Sapulpa, Okla., will increase its capital from \$1,000,000 to \$2,000,000 to double its equipment and install further pipe-line and pumping equipment.

The Wabash Refining Company, Tulsa, Okla., has been incorporated with a capital stock of \$500,000 by J. W. McNeal, C. E. King and D. G. Kehrer and others to do oil refining.

The Night & Day Oil Company's power plant and pumping station at Lawton, Okla., has been destroyed by fire with a loss of \$12,500.

The Gulfport Creosoting Company, Landon, Miss., has been incorporated with a capital stock of \$100,000 by A. E. Fant, H. M. Rollins and W. A. White.

George S. Hurst, Laurel, Miss., will equip a welding and cutting plant, and is in the market for equipment.

The Richards Lumber Company, Lake Charles, La., has been incorporated with a capital stock of \$200,000 by E. Ellas Richards, Thomas H. Watkins and others.

The Crescent City Cork Works, New Orleans, La., will equip a manufacturing plant of 40,000 sq. ft. Horace H. Newman and Anthony Fabre are active in the enterprise.

The Pacific Northwest

PORTRLAND, ORE., Jan. 23, 1917.

Machine-tool inquiries are quite numerous, and while many buyers are holding off after getting quotations, merchants have no difficulty in selling such tools as can be obtained for stock, a good many of which are arriving on old orders. Most business is on single tools of lots of two or three, most of the large projects being fairly well provided for. Much of the buying is by small shops which have been forced into the market by actual necessities, and the accumulation of requirements will doubtless be more apparent from now on. The car situation not only continues to retard lumber development, but is seriously interfering with shipbuilders and other large users of machinery and steel products, shipments being badly delayed on the road. The call for mining machinery is well maintained, and railroad construction projects in this district are expected to require considerable heavy construction equipment in the spring. Canning machinery is a prominent factor, as a large salmon run on Puget Sound is expected this year, and the canning of fruit and other food products is increasing.

It is announced that the Oregon-Washington Railroad & Navigation Company will expend \$3,500,000 in improvements during 1917. The motive power and car department at Albia, Ore., will receive from the apportionment \$125,000 for new machinery and tools.

A number of railroad companies have announced their intention of placing orders for millions of feet of Douglas fir for car building. The Northern Pacific Railway Company has placed orders for 1500 box and refrigerator cars to be built at its shops in Tacoma. The Oregon-Washington Navigation & Railroad Company has placed orders in the past week for 2800 wooden cars, 1800 to be refrigerator cars for the company and 1000 of them going to the Chicago, Milwaukee & St. Paul Railroad.

A total of \$150,000 worth of small wooden hull vessels has been ordered from the smaller shipbuilding plants in the Northwest in the past month. The smaller plants are also kept busy night and day making repairs and overhauling cannery vessels and purse boats, and constructing scows. Work the big plants are unable to handle.

The Huffschmidt-Dugan Iron Works, Bend, Ore., plans the construction of a machine shop to cost \$5,000, and also to expend \$2,000 in other equipment. A two-ton crane is among the improvements planned.

It is reported that Joseph Supple, shipbuilder of Portland, plans to erect a shipyard at the foot of East Belmont Street in Portland. J. B. C. Lockwood, Portland, will have charge of the designing and installation.

The Billrowe Alloys Company, Tacoma, operating a ferro-alloys plant, has recently installed a new furnace and is to add another soon.

The Bayside Iron Works, Everett, Wash., is working night and day on a recent order for 40 metal retorts for use in canneries.

The Overseas Shipbuilding & Construction Company, Seattle, announces that work will begin shortly on its proposed shipbuilding plant in Everett, Wash., on the site of the old Sumner Iron Works. The company has contracts for five auxiliary lumber schooners. The Sumner Iron Works, Everett, will manufacture the engines.

The A. H. Averill Machinery Company, Portland, has recently purchased a 14-acre tract in Portland, upon which it plans to erect an assembling plant to cost \$40,000. Its principal factory is in Dayton, Ohio.

Plans have been completed for the proposed new unit to the car shops of Twoh Brothers, Portland. Considerable new machinery is to be installed.

The Elliott Bay Yacht & Engine Company, Seattle, recently secured contracts for five vessels to cost about \$30,000.

California

LOS ANGELES, CAL., Jan. 23, 1917.

The Warman Steel Casting Company, Douglas Building, Los Angeles, specializing in electric and crucible steel castings, has awarded contract for a new foundry, 110 x 240 ft., at Huntington Park, to cost \$13,000. A 10-ton traveling crane will be installed.

The Los Angeles Union Terminal Company, Pacific Electric Building, Los Angeles, will build a large warehouse and terminal plant on East Seventh and Eighth streets, and South Central Avenue, to comprise seven reinforced concrete and brick structures. The plant will be completely equipped with machinery and apparatus for handling and conveying. The buildings consist of the following: six stories, 100 x 700 ft., to cost \$530,000; six stories, 100 x 574 ft., to cost \$464,000; six stories, 100 x 656 ft., to cost \$515,000; six stories, 100 x 607 ft., to cost \$484,000; two stories, 80 x 600 ft., to cost \$146,000; two stories, 40 x 1260 ft., with two wings each 40 x 140 ft., to cost \$205,000; two stories, 80 x 648 ft., to cost \$156,000.

The Hood Mfg. Company, Los Angeles, has been incorporated with a capital of \$20,000 to manufacture a shock absorber. A. K. Bauer, T. A. Simpson and H. E. Riner are the incorporators.

The Axelson Machine Works, 1406 San Fernando Street, Los Angeles, manufacturer of oil well pumps and fittings, etc., has completed plans for its new plant to be erected at Huntington Park. The plant will include seven structures as follows: A machine shop, 75 x 125 ft.; a forge shop, 25 x 75 ft.; a foundry, 100 x 156 ft.; a pattern shop, 75 x 126 ft.; a pattern storage building, 25 x 30 ft.; a garage, 25 x 100 ft., and an office building, 30 x 100 ft.

The California Metal Enameling Company, 4827 Huntington Drive, Los Angeles, manufacturer of metal signs, etc., has increased its capital stock from \$25,000 to \$100,000 to provide for extensions.

The Karr Mfg. Company, Los Angeles, has been incorporated with a capital of \$1,000,000 to manufacture automobile parts and accessories. Burton A. Karr, Frances Ostrup and W. J. Beager, Los Angeles; George E. Downing, South Pasadena, and F. W. Palliser, Monrovia, are the incorporators.

Arthur Savage, president of the Savage Tire Company, San Diego, Cal., is negotiating with the city officials for a site for the erection of a plant for the manufacture of firearms. The proposed plant is estimated to cost \$250,000.

The East Bay Foundry Company, organized by W. M. Cobb, S. A. Splain, J. Weaver and E. Cuite, is building a small foundry at Ford and Derby streets, Oakland, Cal.

Canada

TORONTO, ONT., Jan. 29, 1917.

War orders estimated to total over \$1,000,000,000 have been placed in Canada since the outbreak of war. Figures issued in October by the Imperial Munitions Board showed that munitions orders placed since the war began amounted to \$550,000,000, of which \$185,000,000 were placed in the first 9 months of last year and about \$50,000,000 in the last quarter of that year. During 1915, the total value of war orders including munitions, was estimated at \$600,000,000. Orders for shells and fixed ammunition in that year amounted to \$305,000,000.

A new power plant, which will include a dam 100 ft. high, to cost \$100,000,000 and develop 2,000,000 hp., from the Niagara Rapids, has been proposed by engineers and the proposal has been sent to the Canadian Government for approval.

The Canadian Aeroplanes, Ltd., has purchased a site of 9½ acres west of Dufferin Street and north of Lappin Avenue, Toronto, at a cost of \$145,000. It will erect a plant of brick and steel at a cost of \$200,000, which will turn out 20 aeroplanes per day. It will cover 4½ acres, leaving 5 acres for future extensions. John M. Lyle is the architect. Plans are being prepared for the building which will be started early in February. T. W. Bailey is president.

Important additions will be made to the plant of the Northern Nut, Bolt & Screw Company, Owen Sound, Ont., including the erection of a new boiler house, another wire annealing oven and a wire-cleaning house. The latter work will leave more room in the present building for wire machinery and frames. A new 50-hp. motor will be installed to operate a nut-drawing plant. Four additional machines, an additional header and an additional bolt machine will be installed. A new hot galvanizing plant and an addition to the electrical galvanizing plant will be built. A keg and box mill will also be erected.

McKinnon, Holmes & Co., Ltd., Sherbrooke, Que., is making extensive plans for future development. The company has

been unusually successful in its general business of structural steel and plate work, having one of the most complete plants in Canada in these lines. It has also been successful in the forging of shells for the Imperial Board of Munitions, having installed a very complete plant for this particular work.

The plant of the Wallace Sandstone Quarries, Ltd., Lyall, Man., was totally destroyed by fire Jan. 23, with a loss of \$250,000. It is reported that the plant will be rebuilt. The Wallace Sandstone Quarries, Ltd., is controlled by Peter Lyall & Sons, Montreal.

Beatty Brothers, Fergus, Ont., will establish a foundry at London, Ont., at a cost of \$30,000. It will be used for the manufacture of parts for pumps, barrel churns, grain grinders, washing machines, etc. Hitherto the company had bought all their castings.

Construction work has been commenced on additions to the Tyee Smelter at Ladysmith, B. C. Additional land adjoining the smelter property has been secured and approximately \$100,000 will be spent on new buildings, among which will be a converter for the output of copper matte as well as blister copper. The present capacity of the smelter is 600 tons daily, which will be increased by 100 per cent. It is expected that the plant will be ready for operation within three months.

The hydrate plant of the American Cyanamid Company at Niagara Falls, Ont., was destroyed by fire Jan. 26 with a loss estimated at \$200,000. The burning of the hydrate plant may affect all of the employees of the company, numbering about 1000 people. The plant will be rebuilt without delay.

Plans are being prepared for a factory for the Canadian Lamp & Stamping Company, Edna Street, Ford City, Ont., to cost \$27,000. Tenders will be received by the architect, G. Jacques & Co., Boug Block, Winnipeg.

The architects, Stewart & Witton, 7 Hughson Street South, Hamilton, Ont., will call for tenders for a brick addition to the plant of the Tallman Brass Company, Hamilton, to cost \$50,000.

Construction work has been commenced on a garage for A. K. Hodgins, Lucan, Ont. It will be one story, 40 x 100 ft., and will cost \$7,000. Complete garage and repair equipment will be installed.

The Port Arthur Pulp & Paper Company, Port Arthur, Ont., will build a pulp and paper mill at Port Arthur, to cost \$1,000,000. A. G. Poundsford, 206 Bell Telephone Building, Toronto, is manager.

The American Sewer Pipe Company, Akron, Ohio, which is planning the erection of a branch plant, will erect it at Toronto, Ohio, not Toronto, Canada, as stated in THE IRON AGE of Jan. 18.

The Brown's Copper & Brass Rolling Mills, Ltd., New Toronto, Ont., will shortly complete the erection of wire mills. It is also planning to lay down a large brass and copper tube mill in a very short time.

It is reported the Canadian Pacific Railway Company, which owns several hundred acres near Port Coquitlam, B. C., will start construction in the spring on its proposed car-building shops. Preliminary work in preparing the site was started in 1916.

The boiler shop and foundry, as well as a large amount of machinery and electric cranes were damaged by fire, Jan. 21, at the plant of the International Engineering Works, Amherst, N. S. The loss will amount to \$30,000. The boiler shop had many orders on hand and reconstruction will be commenced immediately.

Government Purchases

WASHINGTON, D. C., Jan. 29, 1917.

Bids will be received (date not set) by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 640, for one 30-in. drilling machine, four 12-in. and 16-in. lathes, one vertical milling machine, one No. 2 wire feed screw machine and one three-spindle drill press, all for Washington; schedule 651, for one motor-driven winding machine for Norfolk; schedule 682, two 24-in. bench drills, two double emery grinding machines, two engine lathes and schedule 683, one vertical grinding machine, all for Mare Island; schedule 689, one 24-in. turret lathe for Boston; schedule 690, one 14-in. swing engine lathe and one column extension base shaping machine, all for Brooklyn.

Sealed proposals will be received until noon Feb. 6 by the lighthouse inspector at Charleston, S. C., for a vertical single-acting beam air pump with one simplex steam cylinder for marine surface condenser work.

The navy yard commandants will receive sealed proposals until 11 a. m. Feb. 19 for one 40-ton and four 10-ton bridge cranes each at the Norfolk, Philadelphia and Puget Sound navy yards.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

SALE OF GOODS BY SAMPLE—PLACE OF DELIVERY.—Under a sale of goods by sample, the purchaser is entitled to inspect them before accepting them, to ascertain whether they conform to the sample. In the absence of agreement to the contrary, the place of inspection will be presumed to have been mutually intended as the place for delivery to the buyer. Under a contract for delivery at a certain place, title does not pass until such delivery, and any loss of the goods in the meantime must fall on the seller. But the mere fact that the seller has agreed to ship the goods to a certain place does not show that delivery was intended to be made there. In the absence of agreement as to where delivery is to be made, the place where the goods were when the contract of sale was entered into will be treated as the delivery place. (Texas Court of Civil Appeals, Robert McLane Company vs. Sweremann & Schkade, 189 Southwestern Reporter, 282.)

RESCISSON OF PURCHASES OF MACHINERY.—The general rule of law under which the buyer of an article, after inspecting it, or opportunity to inspect it, is precluded from rescinding his purchase on the ground of defects which might have been discovered by the inspection, does not apply to cases where machinery is sold on trial. When a buyer of machinery rescinds his purchase on the ground that misrepresentations concerning its condition were made by the seller's representative, there is no right in the buyer to hold the machinery as security for damages sustained by him on account of the misrepresentations, unless it appears that the seller is insolvent. (Texas Court of Civil Appeals, Hackney Mfg. Company vs. Celum, 189 Southwestern Reporter, 988.)

BUYER'S ACCEPTANCE OF MACHINERY.—Where machinery purchased can be efficiently tested within a few hours after its delivery to the buyer, his retention of it for six weeks and use of it during that time amounts to such final acceptance as precludes him from afterward returning the machinery on the ground of its unsuitability. (Wisconsin Supreme Court, J. L. Owens Company vs. Whitcomb, 160 Northwestern Reporter, 161.)

SIMULATION OF COMPETITOR'S PRODUCT.—A manufacturer of stoves and stove repairs is entitled to enjoin a competitor from marketing parts bearing such simulating marks as to tend to lead the public to believe that the parts were made by the former, but the injunction should not be so broadly worded as to require the defendant to inform purchasers that the parts were not made by plaintiff, defendant being entitled to sell parts not bearing any mark indicative of manufacture by plaintiff. (Pennsylvania Supreme Court, Scranton Stove Works vs. Clark, 99 Atlantic Reporter, 170.)

NEGLIGENT INJURY OF MINOR EMPLOYEE.—Judgment was properly awarded against a company for injury to a 16-year-old boy, resulting from the jarring of a girder he was painting on a gondola car in the loading of another girder on the car, the accident being attributed to the foreman's neglect to properly brace the car. (Broski vs. Phoenix Iron Company, 62 Pennsylvania Superior Court Reports, 305.)

VALIDITY OF NOTES IN ARKANSAS.—The Arkansas statute, which provides that a note given for the price of a patented machine, implement, substance or instrument of any kind shall be subject to any defense in the hands of a transferee of the note that might be asserted against the original payee, and requiring the note to state the consideration for which it was given, does not apply to a note given in another State, nor to a renewal note. (Arkansas Supreme Court, Dodd vs. Axle-Nut Sign Company, 189 Southwestern Reporter, 663.)

ASPECTS OF SALES CONTRACTS.—One who has contracted to buy a stated quantity of goods may reject a shipment containing less. When goods are sold without specifying the price, it being agreed that the buyer

is to pay "the market price," the seller's act in invoicing a shipment at a higher price does not authorize rejection of delivery, but the buyer may refuse to pay more than the market price. (Kentucky Court of Appeals, Owensboro Wheel Company vs. Trammell, 189 Southwestern Reporter, 702.)

GUARANTEES OF PAYMENT.—A written guarantee of payment for goods ordered by a third party from a manufacturer, covering "goods which have been or shall hereafter be ordered," bound the guarantor as surety for the payment for articles ordered after execution of the guarantee, as well as for goods previously ordered. The mere fact that the name of the buyer, a corporation, was afterward changed, did not so substitute a new principal debtor as to release the guarantor's liability; there being now change in the control of the corporation or the ownership of its stock. (Illinois Supreme Court, Scovill Mfg. Company vs. Cassidy, 114 Northwestern Reporter, 181.)

PERSONAL INJURIES TO EMPLOYEES.—An employee suing for personal injury sustained by him in the course of his employment makes out a case *prima facie* entitling him to recover damages, by proving a defect in a working place, tool or appliance furnished by the employer, and consequent injury. (Indiana Appellate Court, Standard Steel Car Company vs. Martinez, 114 Northeastern Reporter, 94.)

ASSIGNMENT OF PATENTS.—An unrecorded assignment of a patent is valid as between the parties thereto and all other persons, except a third person who may subsequently take another assignment from the patentee without notice of the prior unrecorded one. When an invention has been completed and patent proceedings are pending, an assignment by the inventor will make the assignee the equitable owner of a subsequently issued patent. (Indiana Supreme Court, Indiana Mfg. Company vs. Swift, 114 Northeastern Reporter, 214.)

UNGUARDED CONDITIONS IN MILLS.—A company operating a mill is liable for injury to a workman through falling into a pit while passing along the top of a narrow wall in going to his place of work on a dark morning, due to confusion caused by the darkness and escaping steam, if it appears that the wall was unguarded; that it was the usual way for the workmen to go to their places of work, to the employer's knowledge, and that it was the safest way and usually lighted. The reason that supports the rule requiring an employer to keep reasonably safe the places in which his workmen actually perform their labor necessarily extends the rule to the means provided by the employer on his own premises, by which the employees obtain access to their working places. (Glenn vs. Kittanning Iron & Steel Mfg. Company, 62 Pennsylvania Superior Court Reports, 163.)

PENNSYLVANIA COMPENSATION ACT VALID.—The compensation act adopted by the Pennsylvania Legislature in 1915 is valid, and not unconstitutional as depriving employers of their property without due process of law because the act abolishes the defenses of assumption of risk and contributory negligence in an action against an employer who elects not to be governed by the law. Nor is the act invalid as violating the provision of the Pennsylvania constitution which forbids limitation of the amount recoverable for injury to person or property, since the recovery is limited by the act only when the parties to a particular employment contract so agree. (Pennsylvania Supreme Court, Anderson vs. Carnegie Steel Company, 99 Atlantic Reporter, 215.)

INITIAL CARRIER'S LIABILITY—LIMITATION OF VALUE.—A railroad company, having contracted for through transportation of a shipment to a point on another line is liable to the shipper for injury to the freight while in the hands of the delivering carrier and still in transit. Provision in a shipping contract for limitation of the carrier's liability to a certain valuation less than the actual value of the goods is invalid, unless made in consideration of a reduced freight rate. (Kansas City Court of Appeals, Wilson vs. Chicago Great Western Railway Company, 190 Southwestern Reporter, 22.)

ESTABLISHED

Cast

THE use of pipe for fire protection has become general in the last few years. As the number of buildings has increased and the demand for protection has become more exacting, the water pressure in certain districts has had to be a vital factor. In not a few instances, the exigency has been created by the installation of a line fire system for the use of

Cast-steel pipe for this purpose has been great. Confidence has also been strengthened by the steel foundry associations, formerly using cast iron, or favoring it as steel cast iron.

The two illustrations probably the largest cast-steel pressure service pipe ever made, are intricate in design and specialize in the production of large and varied sizes to meet special requirements for the highest pressure lines. The pipe shown which has attended to the use has been published.

This particular pipe was furnished by the P. Smith Mfg. Co., of East Orange, N. J., and the Penn Steel Co. & Machine Co., of Chester, Pa., for use in the pressure service of the Carnegie Library, Pittsburgh. The size is 120 inches in diameter, and is readily comprehended by comparison with the standing beside it.